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ABSTRACT

Based on a study of the need for, and alternatives to, significant expansion of space for state college and university libraries, this report discusses the resultant recommendations, which address both the long term and the immediate space needs of the state's academic libraries. Following a description of the role of academic libraries and a discussion of the need for space for expanding collections and budgetary constraints, the focus of the committee's inquiry is examined by considering alternative solutions to the problem in three general areas: (1) collaboration, encompassing such issues as collaborative acquisitions, shared access/storage; (2) technology, including high density means of publication, e.g., microformats and optical disks; and (3) new storage techniques. Conclusions and recommendations for each of these three areas of investigation point to a need for highly efficient storage and library materials at lower costs, to a sharing of access to the pooled resources of Ohio's academic libraries, and to the benefits of future technological innovation. Six appendixes contained in 38 pages form the main body of the report. They include a summary of the study of Ohio's state-assisted colleges and universities on which this report is based; reports on site visits to the University of California, the University of Illinois, and Harvard University; a discussion of the book deterioration crisis; a review of available storage and retrieval technologies; comparable information about library facilities; and a proposal for the retrospective conversion of bibliographic records. (43 references) (CGD)

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ACADEMIC LIBRARIES
IN OHIO

PROGRESS THROUGH COLLABORATION, STORAGE, AND TECHNOLOGY

Report of the Library Study Committee
September, 1987

FOREWORD

The State of Ohio, like any public entity, is frequently charged with applying scarce resources to pressing and escalating problems. This was clearly the case a year ago when the Ohio General Assembly, alerted by the Board of Regents to sharply expanding requests for new academic library facilities, together with projections of a steady-state capital budget, gave support to and directed the Board to "conduct a study of the need for, and alternatives to, a significant expansion of space for state college and university libraries."

The Library Study Committee appointed to assist the Board's staff in this task has accomplished an extraordinary feat: it has brought forward recommendations that address both the long term and the immediate needs of the state's colleges and universities. These recommendations promise to effect major savings over previous expectations of capital expenditures, and offer at the same time the possibility of important improvements in the quality of every institution's holdings.

The Committee's carefully crafted recommendations speak to highly efficient storage and library materials at strikingly lower costs, to a sharing of access to the pooled resources of Ohio's academic libraries, and to the benefits of future technological innovation. As a result of the comprehensive report of this Library Study Committee, what initially appeared as a difficult dilemma can now be viewed as a genuine and exciting opportunity to strengthen dramatically higher education within this state. The Ohio Board of Regents and I acknowledge, with profound appreciation, the exemplary manner in which the Committee fulfilled its charge.

William B. Coulter
Chancellor

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LIBRARY STUDY COMMITTEE REPORT
EXECUTIVE SUMMARY

Introduction

The most recent capital improvement requests submitted to the Board of Regents by Ohio's public colleges and universities make clear that these institutions are experiencing a severe library space problem. It is apparent that, unless actions are taken very soon, the shortage of space will threaten the quality of college and university library services and collections, and consequently, the viability of the academic endeavor.

Issues of Need and Constraint

The undeniable importance of excellence in libraries to excellence in college and university programs makes it obvious that a solution to the existing and projected space problems must be found. However, it is also clear that the use of traditional library facilities to resolve this rapidly expanding problem would require resources far beyond those expected to be available either in the regular capital appropriations or from other sources. In consequence of this dilemma the Ohio General Assembly directed the Ohio Board of Regents to: "Conduct a study of the need for, and alternatives to, a significant expansion of space for state college and university libraries" (Sub. H.B. 870). The Board, in turn, appointed a Library Study Committee, composed of individuals with diverse academic, administrative, and business backgrounds, to prepare recommendations. This document is that Committee's report.

The Role of Academic Libraries

The Library Study Committee concluded at the beginning of its discussions that the role of the academic library must be considered in its broadest contemporary sense and that the committee should consider such opportunities for improving the quality of libraries as might appear in the context of its considerations. This wider perspective is necessary because the academic library of today has a threefold purpose, serving not only as a storehouse of information, but also as a gateway to information held elsewhere, and as a center for instruction **about** information.

Procedures

The Committee met over a period of nine months. During that time it completed a study of responses to similar problems in other states, surveyed Ohio's state-assisted colleges and universities on their present and projected needs for space, commissioned a consultant's report on the status of technology and the academic library, heard testimony from publishers on their plans for the future, and visited three universities where innovative and creative steps have been taken to address not only the storage of library materials, but more importantly, functional, ready access to them.

Alternative Solutions

The Committee determined that there were three general areas that needed to be addressed in order to find solutions to the crisis facing Ohio's academic libraries. They are: 1) **collaboration,** which encompasses a range of issues such as collaborative acquisitions, shared access, and shared storage; 2) **technology,** including high density means of publication such as the existing microform and the emerging compact disk; 3) **alternative storage,** including the various methods of maintaining rarely used materials in a warehouse environment. There is significant opportunity for long-term savings in each of these areas, but it is important to note that all either involve important startup costs or have the potential seriously to restrict user access, or both. The Committee therefore concluded that, while none of these approaches offers by itself the possibility of resolving the problem of space in an acceptable way, a careful blend of the best features of each could not only respond to the anticipated constraints but also advance the quality of academic library services.

Conclusions and Recommendations

In direct response to the constraints on the capital budget, the Committee **recommends that the state of Ohio restrict construction of traditional academic library space and require public universities to explore and pursue solutions to library space problems other than the construction of conventional library buildings.**

The Committee recommends that in all cases where space is a problem, universities develop plans for use or construction of medium or high density storage space (which can be constructed for between one-half to one-fourth the cost of conventional space) in either local or

regional configurations in their 1987 or 1989 capital improvement requests. The Committee also recommends that the Board advocate and give priority to collaborative storage projects, and that a high density facility be built at the Ohio State University as soon as possible. Finally, the Committee suggests criteria which might be used in evaluating proposals for conventional library facilities.

In the area of collaboration, the Committee's principal recommendation is that Ohio move to improve the quality of academic library services through the creation of a statewide electronic catalog. This linking of library catalogs through an access network would, without the laying of a single brick or the purchase of a single book, make **all** library holdings available to **each** library. Collateral recommendations include conversion of remaining paper records to computer format, the development and implementation of a statewide distribution system for library materials, an incentive program for collaborative projects, and the creation of a collaborative plan to address the serious issues of preservation of books and other vital materials endangered by acidic paper.

With regard to technology, the Committee recommends that the Ohio Board of Regents monitor the many developments, either newly extant or on the horizon, that promise to affect the operations and services of academic libraries in a significant way. The Committee further recommends that the Board initiate and fund with state, federal, or foundation money, studies and pilot projects to explore the uses of new library technology.

Finally, the Committee observes that its recommendations are designed to address critical objectives: highly efficient storage of library materials at strikingly lower costs; a major increase in access to all of the resources of Ohio's academic libraries; pursuit of the promise of technological innovation. The Committee has reinforced these general goals with suggestions for specific actions, but it recognizes that it cannot anticipate even the changes that will occur in the next few years. Accordingly, the Committee's final recommendation is that the Board of Regents designate a broadly based committee to advise and report regularly on the implementation of the objectives set forth in this report.

INTRODUCTION

In its 1986 Capital Budget Bill Sub. H.B. 870, the Ohio General Assembly directed the Ohio Board of Regents to:

> "Conduct a study of the need for, and the alternatives to, a significant expansion of space for state college and university libraries."

It had become apparent during the most recent Capital improvement request process that a severe library space problem exists at state assisted universities and threatens the quality of library services and adequate housing of collections. The costs of dealing with the problem in traditional ways seemed prohibitive.

The Ohio Board of Regents, in response, appointed a 17-member Library Study Committee. In selecting the members of this body, the Board appointed representatives from among the state's academic library directors and university academic and fiscal officers and included, also, individuals knowledgeable about the relevant technologies, scholars with prior experience in national studies in information science, and individuals with a background in related business areas. The membership of the Library Study Committee appears on the inside cover. This Committee spent an academic year examining the issues outlined in its charge from Chancellor William B. Coulter, which stated in part:

> "While the purpose of the study is a direct consequence of the need to make informed decisions on the capital budget, the scope of the Committee's work will necessarily cover a broad range of issues affecting the operation of academic libraries. In particular, rapidly changing technologies and concomitant changes in the conceptual approaches to information storage and retrieval will require careful examination."

Prior to the first meeting of the Committee, the Ohio Board of Regents assembled relevant background materials.[1] This document included an introduction and overview of the library space problem, a summary of relevant documents from other states, and a commissioned report on the state of library technology. In conducting this study, the Committee studied the background materials, surveyed Ohio's state-assisted colleges and universities regarding their present and projected needs for space (Appendix A), heard testimony from publishers regarding the influence of technology in publishing practices, and visited three universities (Appendix B) where innovative and creative steps have been taken to address not only the storage of library materials, but, more importantly, functional, ready access to them.

As the Committee went about its work, it did so with a spirit of discovery, endeavoring to bring to the Ohio Board of Regents and the Ohio General Assembly its best reasoned and informed judgment. The substance of the Committee's findings is reported in four sections: (1) The Role of Academic Libraries, (2) Issues of Need and Constraint, (3) Focus of Committee Inquiry: Alternative Solutions through Collaboration, Technology and New Storage Techniques, and (4) A Vision for Ohio: Conclusions and Recommendations.

THE ROLE OF ACADEMIC LIBRARIES

Since the formation of universities in the late Middle Ages, the role of the library has been a central distinguishing feature in the organized pursuit of knowledge. Once chained to walls and accessible only to a privileged few, books and manuscripts moved from monasteries to the shelves within secular universities and private libraries after the invention of the printing press in the mid-fifteenth century. Since then those shelves have grown in extraordinary ways as the printed page proliferated, especially in the twentieth century. Publishing has expanded dramatically, and in recent years has become a virtual flood. The rapidity of information growth in the last twenty-five years has eclipsed whatever the world has previously known. Now information presum-

[1]Hairston, Elaine H., Edward O'Neill, and Patricia Skinner, *Library Study Committee Background Materials*. Ohio Board of Regents, Columbus, Ohio, September, 1986. (Available on request from the Ohio Board of Regents, 30 E. Broad Street, Columbus, Ohio 43266-0417.)

ably doubles every ten to fifteen years. This virtual explosion of knowledge and concomitant growth and diversification of academic programs has resulted in unforeseen demands on the services and storage capacities of academic libraries.

Besides collecting current materials and information to support academic programs, academic libraries, and research libraries especially, also serve as repositories for information which is rare, esoteric, and of great disciplinary depth. This special role has increased the demands upon library storage and has created, particularly in an age of information explosion, a shortage of space in academic libraries across America today.

Libraries are judged by their collections and their ability to respond in a timely way to the information needs of their patrons. Their purpose is to provide access to information from their own holdings and from those of other libraries. The concept of the library today is changing rapidly from one of a space-bound institution that houses within its own walls all the information that any user might require, to one of a gateway to knowledge—a "meta-library" or a library without walls. This new library would give users access to information not only all over campus and throughout the State, but also across the country and, in some cases, around the world.

In certain computer-based systems, for example, patrons can search electronic "card" catalogs and databases from remote locations. In others, with a press of a key or the pass of a bar code reader, books can be charged from a library at one institution and even delivered to users at another. Today's academic libraries only hint at tomorrow's promise of greater access, responsiveness, and comprehensiveness. Such promise, however, requires laying foundations, and foundations that today appear cloaked in the problem of storage may in fact provide the opportunity to enhance significantly Ohio's academic enterprise. The library, with its threefold role as a storehouse of information, a gateway to information held elsewhere, and a center for instruction about information, remains at the core of higher education.

The State of Ohio now has an opportunity to secure and reinforce its investment in higher education through the development of innovative approaches to resolving the problems of storage and access to information that face its colleges and universities.

ISSUES OF NEED AND CONSTRAINT

In its initial effort to understand the magnitude of additional space needs in Ohio's college and university libraries, the Library Study Committee surveyed Ohio's state-assisted higher education institutions regarding library space needs and then sought to relate these needs to the limited capital resources available from the State of Ohio. A discussion of both provides important background for understanding the committee's recommendations.

Need

Indications of a serious need for additional library space surfaced in the 1986 capital budget requests from Ohio's colleges and universities. For the three biennia for which capital plans were solicited (1987-1992), library-related requests amounted to $121.7M. The universities were requesting the addition of traditional facilities to support new or expanded programs, as well as the replacement of obsolete or worn out facilities. A significant portion of the requests for new library space related to the large and annually expanding number of published materials which academic libraries require to support educational programming and which they are expected to store. It appears that for at least the next decade projected capital expenditures for libraries are essentially open-ended. Almost every university and a number of colleges will require additional or replacement library space. Furthermore, after a ten-year construction cycle, it is likely—if only traditional solutions are pursued—that the pattern of needs and requests would begin anew. With no real end in sight, the prospective costs are truly formidable.

The survey conducted by the Library Study Committee reveals that the capital requests received in 1986 are symptomatic of an impending crisis because Ohio's academic libraries are either full already or will be full soon. This is not at all surprising, for many university

libraries were built or expanded twenty to thirty years ago, with an estimated storage capacity at the time of approximately twenty to twenty-five years. The Ohio State University, for example, was forced to resort to unsatisfactory warehousing for over 100,000 volumes in 1986, and expects to add substantially to that total in succeeding years. Housed in facilities not designed for library storage, books are poorly cared for and difficult to access.

Based on current acquisition rates, if libraries continue to fulfill their missions, Ohio's universities will need approximately 109 miles of new shelving space to accommodate additional materials in the next decade alone. (See Table I) This mileage translates into 400,000-500,000 square feet of conventionally arranged stack space, or an increase of over 30% of the library shelf space currently in existence. This calculation does not even address the problem of replacing aging, obsolete, or deteriorating library space.

Table 1 charts an estimate of the miles of additional library shelving which will be needed by university libraries during the next ten years, assuming the current acquisition rates.

Two-Year College Situation. Because the two-year system is relatively new compared to the university system, it appears that, for the most part, the storage issues confronting university libraries do not apply to the two-year schools. Materials have simply not been accumulated over a comparable length of time. Moreover, technical programs emphasize current materials and do not require frequent access to older or historical sources. Two-year libraries weed their collections (i.e., discard older materials) vigorously. As a result of these factors, the basic general education collections of community colleges and regional campuses are relatively stable.

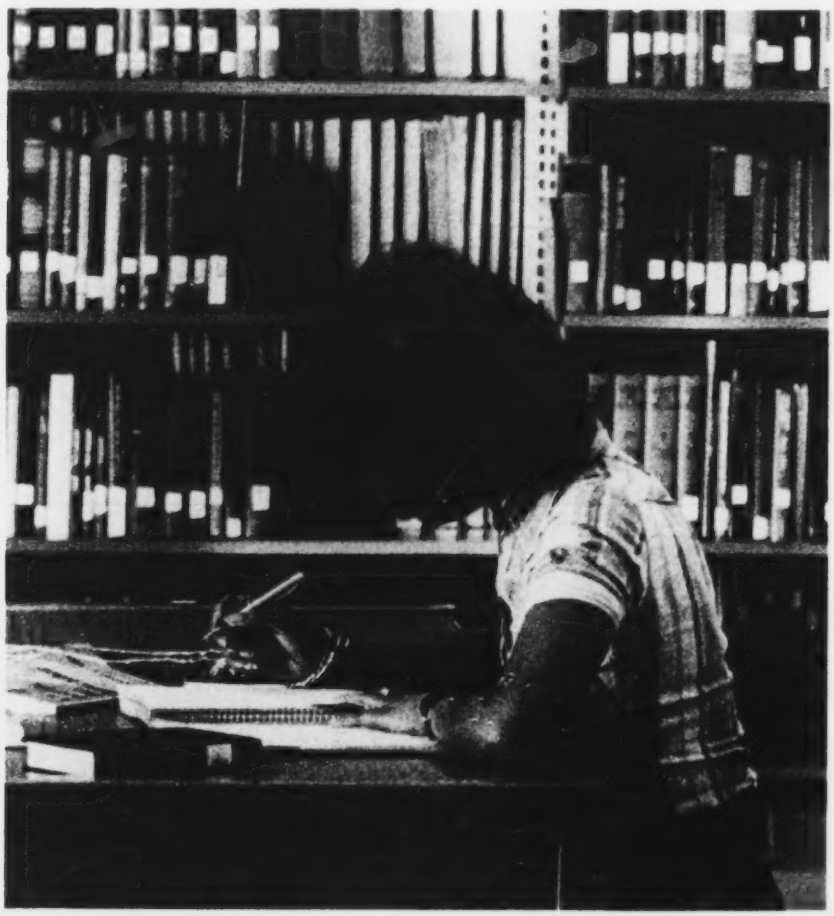


TABLE 1
VOLUMES HELD BY LIBRARIES OF THE 13 STATE-ASSISTED UNIVERSITIES IN OHIO

INSTITUTIONS	VOLS. IN LIB. 6/30/86	VOLS. IN LINEAR FEET*	VOLS. IN MILES**	VOLS. ADDED 1985/86	VOLS. IN LINEAR FEET*	VOLS. IN MILES**	ADDITIONAL MILES IN TEN YEARS
Univ. of Akron	1,040,378	115,597	21.9	41,181	4,576	.87	8.7
Bowling Green State Univ.	1,172,889	130,321	24.7	45,377	5,042	.95	9.5
Central State Univ.	148,921	16,547	3.1	3,592	399	.08	.8
Cincinnati, Univ. of	1,736,978	192,997	36.6	71,726	7,970	1.51	15.1
Cleveland State Univ.	680,488	75,610	14.3	18,085	2,009	.38	3.8
Kent State Univ.	1,609,598	178,844	33.9	39,661	4,407	.84	8.4
Miami Univ.	1,087,014	120,779	22.9	29,142	3,238	.61	6.1
Ohio State Univ.	4,077,575	453,064	85.8	110,862	12,318	2.33	23.3
Ohio Univ.	1,284,130	142,681	27.0	54,025	6,003	1.14	11.4
Shawnee State Univ.	70,421	7,825	1.5	1,495	166	.03	.3
Univ. of Toledo	1,343,348	149,261	28.3	53,721	5,969	1.13	11.3
Wright State Univ.	604,886	67,210	12.7	20,560	2,284	.43	4.3
Youngstown State Univ.	656,683	72,965	13.8	28,164	3,129	.59	5.9
	15,513,309	1,723,701	326.5	517,591	57,510	10.89	108.9 326.5 435.4

**Volumes are divided by 9 to obtain linear feet of volumes, with 9 as the average number of volumes in one linear foot*
***To obtain rules of volumes represented, linear feet are divided by 5,280*

Because two-year campuses serve an extensive non-traditional college population, their libraries often serve as learning centers to a greater extent than do their four year counterparts. These centers or learning laboratories provide audiocassette, videocassette, computers, and audiotutorial equipment and materials to complement classroom learning or provide prescribed individualized learning opportunities for students. Such learning aids are significant space-users.

It seems likely that additional or remodeled space requirements in the two-year system will relate mainly to instruction and learning support requirements. Indeed, insufficient funds for current acquisitions is the greater concern for the two-year college libraries.

Current Means of Space Management. Ohio's academic libraries have been trying to cope with their storage problems in a variety of ways. Many temporary and unsatisfactory measures have been taken to find additional space for shelving. Most commonly, libraries have replaced seating and study space with bookshelves and have thereby lost necessary reading and work space for users. As a result, many academic libraries have become crowded, making it difficult for users to gain ready access to the materials necessary for effective study. Some institutions have also reassigned office, classroom or other campus space for library purposes. While such action may relieve immediate patron congestion and ease acute storage problems, it may at the same time interfere with other important institutional purposes and, in the long run, lead only to other problems.

While weeding is a commonly used device for limiting collection growth in two-year colleges, it is less effective in university libraries. Universities primarily purchase for permanent retention and maintain collections far larger than two-year colleges. Studies on weeding as a space-saving strategy for university libraries suggest that the time, effort, and staff resources required make this a solution of limited effectiveness. Even when it is used in large libraries, it does not appreciably slow the rate of collection growth.

Finally, many institutions have made major efforts to purchase more materials in microformats, which enjoy a major size advantage over print counterparts. However, while such materials can be stored in less space than conventional material, the reading stations and microformat printers require space of their own. Moreover, most users generally dislike microformats. These points, taken together with the fact that microformat substitutes are available for relatively few printed materials, limit the potential of microforms to achieve dramatic space savings.

It is apparent that despite earnest efforts to address library space problems, the information explosion and growth in Ohio's academic programs make the need for additional storage for library materials very real indeed.

Budgetary Constraints

It is perhaps obvious that there are significant budget constraints which restrict the ability of the State and the universities to address the library needs presented above. Nevertheless, it is useful to discuss briefly the following basic axiom in the present context:

The demand for public services will always exceed the available public resources. Therefore, maximizing the efficiency with which public funds are applied to a particular public need is essential.

Identifying alternative, efficient ways to meet the library facility needs of Ohio's colleges and universities will have two important effects:

1. It will help limited state capital appropriations meet the many other facilities needs of colleges and universities more effectively.

2. Since these facilities appropriations are supported by state issued debt that must be repaid, minimizing the necessary capital expense will also minimize the resulting debt service burden on the state's operating budget for higher education.

The Committee was given a comprehensive briefing on the past and projected trends in higher education debt service requirements in the State's operating budget. The debt service has been growing rapidly, and it is becoming a larger percentage of total operating appropriations for higher education. This information intensified the Committee's appreciation for the general constraints on public resources, since it concludes that the total of future higher education capital appropriations should be even more constrained than in the previous few biennia.

Thus, we need ways of meeting facilities needs with the

least total costs to help limit the growth of future debt service.

Recognizing the importance of budget constraints, the Committee searched for basic approaches which might lead to improvements in cost, efficiency, and effectiveness. The results of that search are discussed in the next section of this report.

FOCUS OF COMMITTEE'S INQUIRY: ALTERNATIVE SOLUTIONS THROUGH COLLABORATION, TECHNOLOGY, AND NEW STORAGE TECHNIQUES

During its study of alternatives to the library space needs of Ohio's colleges and universities, the Committee was guided by four major assumptions:

1. That the improvement in quality of academic libraries is integral to Ohio's effort to provide excellent institutions of higher education.

2. That the efficient maximization of investment in library resources should always enhance access and service to users.

3. That college and university libraries are among the most highly shareable of all higher education resources.

4. That limits to capital investment in new buildings are, indeed, real, and have great significance in the issue of overall library needs.

The Committee explored three primary alternatives: collaboration, technology, and storage.

Collaboration

Recent Collaboration in Ohio. In Ohio, and indeed in the United States generally, a willingness and predisposition of libraries to cooperate with one another have long existed. From interlibrary loan to the shared development of automated systems, librarians have endeavored to buttress the work of one another. In 1967, Ohio's colleges and universities, with assistance from the Ohio Board of Regents, cooperatively created the Ohio College Library Center (OCLC), a nonprofit membership organization. Since renamed the Online Computer Library Center, OCLC now provides online cataloging, interlibrary loans, and other library services to some 7,000 libraries worldwide utilizing a member-contributed database of over 15 million bibliographic records to which are currently attached some 270 million library location symbols.

Thus, economies of shared cataloging and consequent benefits of improved access to library collections were the principal reasons for the creation of OCLC's pioneering computer-based statewide cataloging system early in the 1970's. While this system has permitted the sharing of books and journals among many Ohio libraries and with other libraries across the country, it is, nevertheless not currently configured or designed to meet the requirements of the online catalog system the Library Committee believes is necessary for Ohio's future.

Even through OCLC, complete access to Ohio's academic library collections is currently not possible, since not all catalog records prior to 1971 have been converted to machine-readable form and made available within the OCLC database. The completion of retrospective conversion of these bibliographic records is essential for complete access to Ohio's library resources.

The majority of Ohio's 135 academic and 250 public libraries obtain OCLC services and products through OHIONET, a state-level network, and participate in other OHIONET-based cooperative ventures and services as well. Many of Ohio's libraries also belong to regional library cooperatives (organized by county or metropolitan areas) whose primary missions are facilitation of resource sharing and the answering of reference questions. The thirteen state-assisted university libraries, which provided some 170,000 interlibrary loans in 1985/86 (the majority to other Ohio libraries), provide reciprocal on-site borrowing privileges for faculty and graduate students, as well as waiving all charges for interlibrary loans among the group.

It should also be noted that at least eight of these 13 libraries have automated local systems for circulation control. In some cases, these systems also serve as a supplement to or substitute for the card catalog. The systems are of different brands and vintage and therefore do not intercommunicate, but several offer no-charge dial access to those who find it useful.

But as productive as these and many other forms of cooperation among Ohio libraries have been, new forms of collaboration, which can more effectively promote and facilitate the sharing of library resources, while secondarily providing the context and potential for some degree of cooperative collection development, are now possible. A brief case study of the efforts of the State of Illinois is instructive.

Access in Illinois. The University of Illinois at Urbana-Champaign has the largest publicly supported academic library in the United States and the third largest research library in the U.S. (after Harvard and Yale) with holdings of approximately seven million volumes. This library resides within a state which has historically placed a high value on libraries and their collections. In addition, within Illinois government, the Office of the Secretary of State, who is designated in statute as the State Librarian, has provided sustained leadership operating under the principle that academic libraries are part of the state's resources and therefore deserve state support from that office. Within this environment, the University of Illinois has implemented a comprehensive, brief-record on-line circulation/catalog system which is searchable by author, title, and classification (subject) number, and also indicates whether a given item is charged out. If charged, a save may be placed, and the book will automatically be sent upon its return.

This statewide Library Computer System (called LCS) allows the user to browse the "electronic shelf," finding other books on a topic if the specifically sought title is not available. It allows a patron at any one of the 29 academic libraries whose catalog records are currently in this database to search directly the titles held at all other locations and to charge them out by computer terminal. Thus, in Illinois, the patron has access not only to the local library's materials, but also to those of 28 others, which include over 16 million volumes and represent over 9 million titles. A courier system provides document delivery around the state with a promise of receipt within 2-10 days, depending on the location of the borrowing and lending libraries.

This rich bibliographic database is also available for searching only to any library in Illinois which has a computer terminal with dial-up capability. Interlibrary loans, however, must be effected through the headquarters library in one of the eighteen Regional Library Systems. Plans anticipate that by 1992 there will be an increase in the number of directly participating libraries from the current 29 to about 60 (including many public libraries), thus greatly enlarging the database and increasing the volume of interlibrary loans transacted via the system — which numbered 305,000 in 1985/86.

The University of Illinois at Urbana-Champaign has also implemented a full bibliographic record online catalog (called FBR) which additionally allows searching by series title, subject headings, and key words (singly or in combination) anywhere in the record. This advanced system, a true substitute for and improvement over the card catalog, will also become a statewide resource through the inclusion of all machine-readable catalog records created to date through OCLC by all Illinois libraries, thus making it a substantial statewide catalog; and any library may also elect to use the system as its local online catalog.

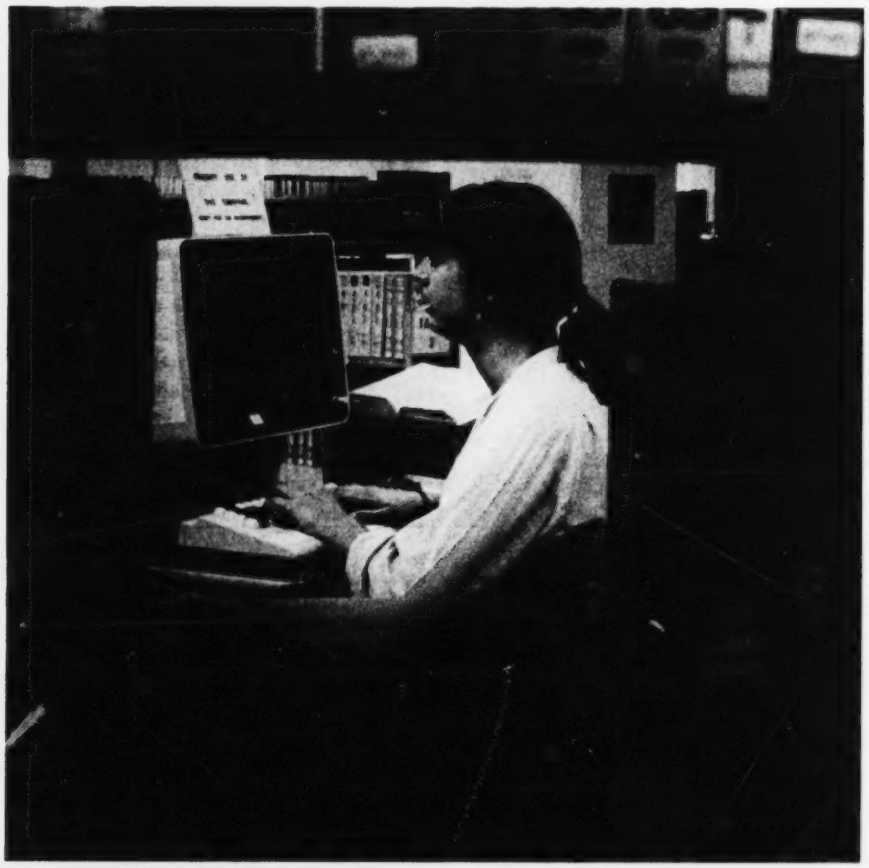
These automated systems constitute a statewide resource and service which has been developed to enhance the use of diverse library collections that represent significant investments on the part of the State of Illinois. In a time of limited budgets, the linkage of available resources not only has the potential to maximize what is already held, but it also implies the possibility of planning collections for statewide access through cooperative collection development.

Illinois has begun to encourage a cooperative collection management strategy among its academic libraries. Currently this endeavor consists of a statewide committee (Cooperative Collection Development Committee) which has been given seed money under the Illinois Higher Education Cooperation Act to provide grants to libraries for cooperative collection development activities. Using the LCS database, the Committee has compiled profile information regarding the quantity of the library collections represented in LCS by stratifying all records into 495 subject categories. They are also developing a "quality" indicator evaluation mechanism to assess which libraries have the best collections in given subject areas. To date, qualitative analyses have been undertaken for a relatively small number of the subject

divisions, as such analysis is tremendously labor intensive.

Clearly these several cooperative library developments in Illinois have had very tangible, far-reaching benefits. It is believed that much more progress lies ahead. Whether adaptation of either the Illinois model or development of one unique to Ohio's existing resources would be advantageous and affordable for Ohio obviously requires much more extensive study and analysis; but there is strong reason and evidence to conclude that the library access that has been accomplished in Illinois, as well as what is planned, warrants very serious and thorough scrutiny for possible application in this State.

Preservation. Beyond access, it is apparent that the issue of preservation requires collaborative attention. Paper upon which books have been printed in the last century (and which publishers still use today) is highly acidic and therefore becomes brittle and disintegrates over time. This serious—and very expensive—matter requires seeking a collaborative solution for repair of held volumes, climatized storage for endangered collections, photocopy reproductions, microfilming or use of optical disk technology to salvage valuable scholarly materials. Also required is the study of deacidification technologies which can preclude the rapid deterioration of newer publications. Appendix C provides a useful discussion of these serious matters from the perspective of academic libraries.



HILANDA
ROOM

Technology

The modern library can trace its technological origins to the invention of the printing press which made the book and journal as we know them possible. With printing came the information explosion and the development of the massive libraries of today. Since Gutenberg, printing has been the dominant technology for libraries. But, as new technologies are maturing to propel libraries and library users into a new era, futurists are predicting the end of print's domination.

The Library Study Committee has carefully examined the application of existing technologies and has made a considerable effort to understand the potential of new developments. The following is a brief description of the major technologies and technological issues that are affecting or beginning to affect in a significant way the operations of libraries. They are described in greater detail in Appendix D.

There are three principal areas in which technology promises to affect the development of libraries: storage, retrieval, and access.

Storage Technologies. Microformats, which have been in use for some time, have great potential to save space but, as noted above, their relatively limited availability, the space required for associated equipment and — more importantly — user resistance will likely restrict their ability significantly to ameliorate further the storage crisis. Microformats have proven archival quality, although the expense of filming makes this an impractical approach to preservation unless done on a collaborative basis.

Computer-based storage systems, particularly the various kinds of optical disks, have the potential to store vast quantities of information in a more effective manner than microformats and at a cost which might well be attractive for many kinds of publications. Still, this technology is quite new and there are many unknowns. To what extent, for example, will publishers adopt this format? In which areas and for what kinds of material will users prefer this medium? Are the materials employed stable enough to be considered archival?

The Library Study Committee believes that the increased use of computers, together with the potential of optical disk technology, will significantly influence libraries and library storage. However, it is not apparent how quickly this technology will affect the need for additional storage, and therefore, with some frustration, the Committee believes that carefully following and experimenting with technological developments may be the only course of action the State can realistically follow at this time.

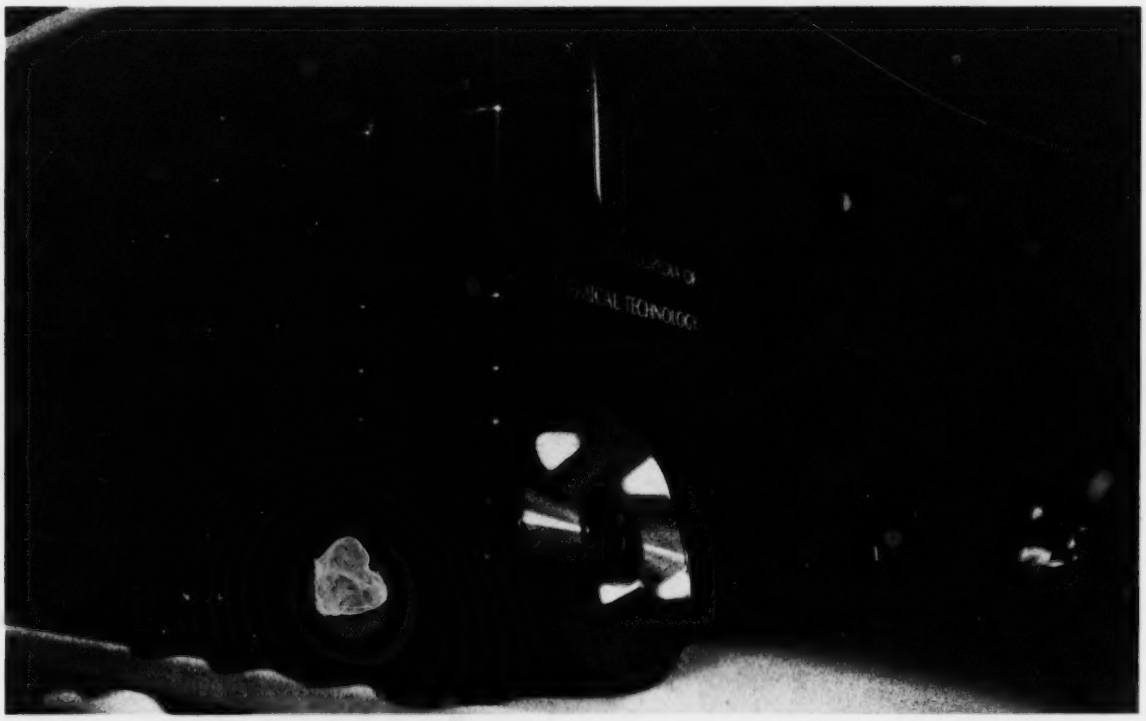
Retrieval Technologies. Technology has already had a tremendous effect on libraries through such developments as electronic circulation systems and catalogs. The exploding popularity of electronic databases such as Ohio-based Mead Data, Compuserve, OCLC, and Chemical Abstracts, promises to increase the use of libraries as patrons seek to locate the information referenced by such databases.

Access Technologies. Technology is also developing which will help the user access information remotely, allowing many users to employ the resources of the library without physically entering it or removing its books and journals. Facsimile transmission, which sends a copy of a document from a library machine over a telephone line to another machine at the user's location, is one means of accomplishing this, but facsimile is expensive in labor, telecommunications, and equipment. Direct access to online text is another means. All of these factors should become less of a barrier over time.

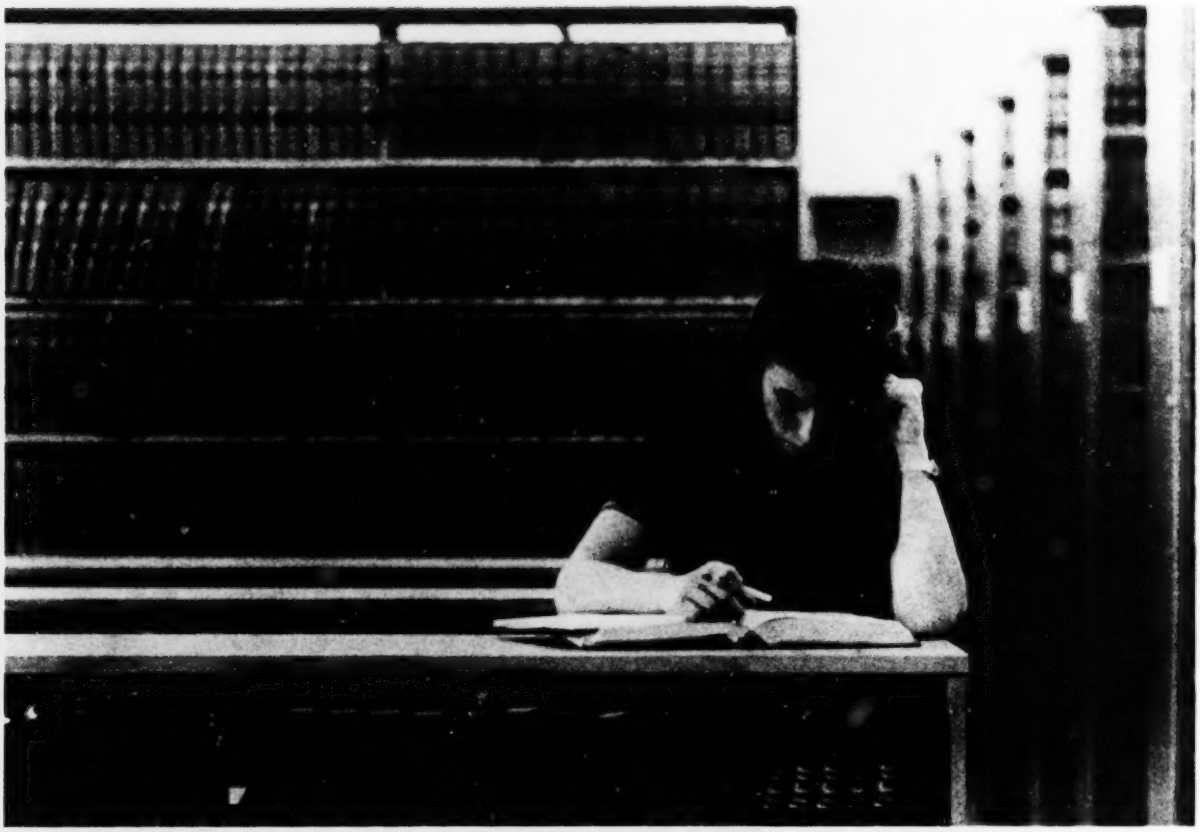
Summary Thoughts on Technology. The technologies that will affect libraries are broad in their implications for the future design of libraries. They will help transform libraries from repositories of information into gateways to information. However, it is very difficult to understand at this time the eventual direction the technologies will take. By the turn of the century, some will likely have a profound effect; therefore, careful attention must be paid to technological development.

Storage Alternatives

In the conventional view, an academic library sits in a central campus location, and is ideally designed for utilization of the treasure that it holds. Books are generally shelved in call number order and are available for browsing in well-lighted, climate-controlled stacks. Reading space for students and other patrons is abundant, and all the resources one might need are in the library's current holdings. This image, unfortunately, no longer reflects the reality of academic libraries in Ohio. Were one to examine the many well-planned and beautifully built libraries of this century, the reality of study space displaced by shelving, cramped quarters for users, books



Google Test
Field Test Disc



unavailable because they are warehoused, physically deteriorating collections, and increasingly inadequate budgets would unfortunately be all too evident.

As other states and private universities have examined the urgent issue of space, they have developed several construction alternatives to the expansion of conventional library space. Most frequently these alternatives include combinations of compact shelving and off-site high-density housing of library materials. In reviewing several storage innovations, the Committee tried to keep the library user in mind and evaluated alternatives accordingly.

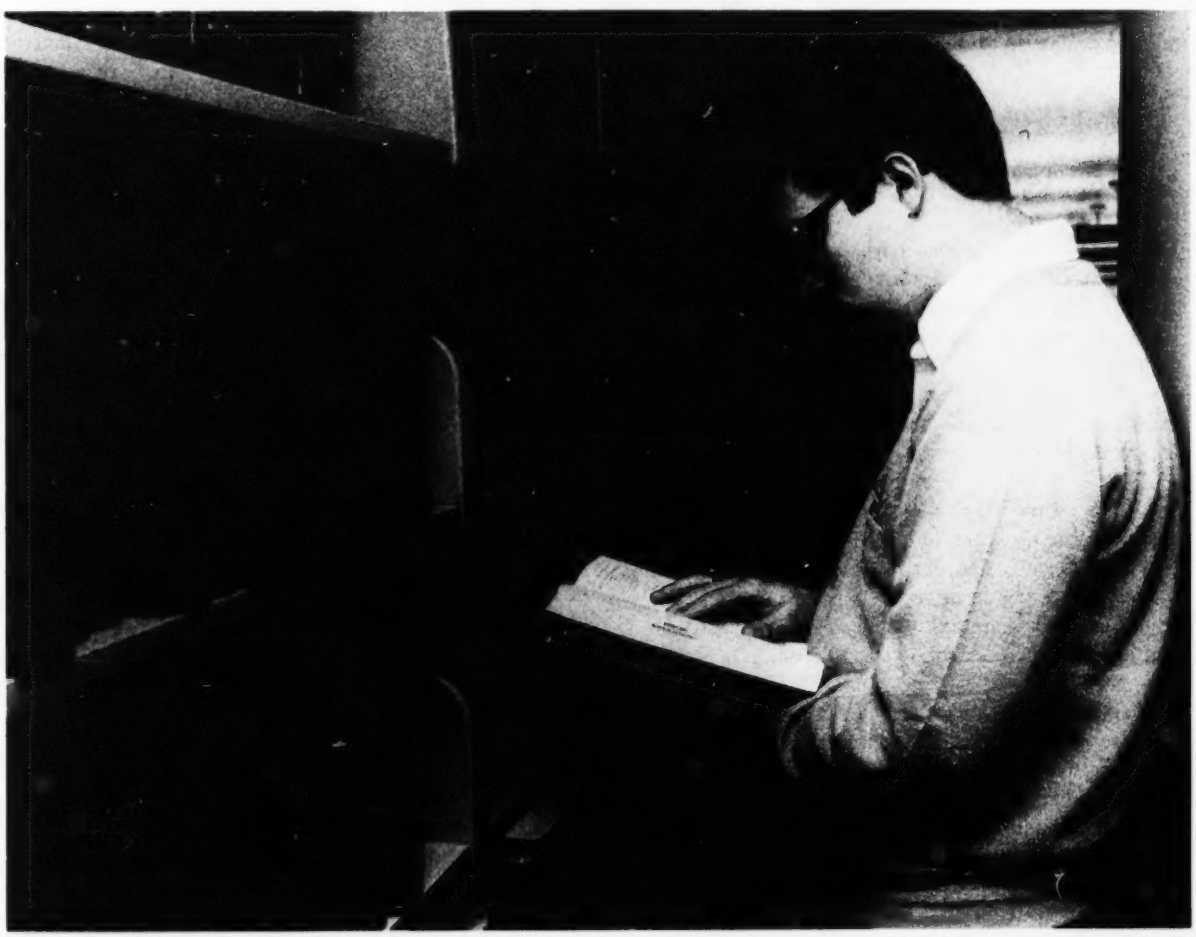
In general, library patrons believe that accessibility and proximity significantly influence the effective use of stored library materials. User accessibility can be determined with answers to these simple questions: Is the storage area open (at least potentially) or is it closed to users? Is it possible for users to browse the collections, to determine the availability not only of specific volumes they may have been seeking, but also of related works with which they are not familiar but which might be of great value to their research? The issue of shelf browsing is important to users because, on the one hand, this is a research approach which is widely perceived to be important to everyone from general users to scholars, and because, on the other hand, most low-cost approaches to storage do not permit it.

Proximity is a related but nonetheless different matter. Users typically believe that they are better served if library materials are stored close to the majority of the user population. Even if patrons have direct physical access to library books and materials, the value of the service will be diminished if the user has to travel to another library or to some kind of storage facility. If direct access is not permitted, then users might well believe that the quality of service has been diminished even more because distance increases delays in the delivery of materials to the user's location.

Ideally then, in order to provide ready physical access to library materials, academic libraries should build more conventional space on campus to house their growing collections and should also acquire collections that are virtually self-sufficient. Neither is possible, of course, under current—and very likely future—fiscal circumstances. So once again, the conventional solutions to problems and budget constraints conflict, and it is necessary to examine alternatives.

In doing so, the Committee has analyzed the alternatives largely in terms of "density." Predictably, as with other issues impacting library storage, density is of increasing importance as the problems of storage costs become more acute. The traditional library with open, browsable shelves, is described as a "low density" storage facility. Books are stored according to the order in which they are classified by subject (i.e., "call number order"), an approach which requires that unused space be left on each shelf to permit the insertion of additional volumes, precluding the need for frequent (and expensive) shifting of collections. Shelving in call number order is also inherently inefficient in that space must be provided for the tallest books, thereby wasting a great deal of vertical area between shelves for the sake of accommodating the call number order.

"Medium density" storage can take several forms. One, compact moveable shelving, like that installed at the University of Illinois, compresses aisle space in a way that permits users to enter only one aisle at a time in a specific stack area. Medium density storage might also save space by putting new books and volumes over a certain size in separate areas. Although the variations on



this type make generalizations difficult, a typical medium density facility would reduce direct accessibility somewhat compared to the typical low density space, but it would be more cost effective. Medium density facilities, as a rule, could save as much as half the cost of conventional library storage space.

"High density" facilities also take a variety of forms, but some general characteristics are apparent. Typically, only rarely used but nevertheless valuable materials are placed in high density repositories. Volumes are stored by size rather than in call number order. Shelving is likely to be very compact, for example, two deep (i.e., books literally out of sight, behind others) as in the University of California's Northern Regional Library Facility, or in boxes on towering shelves as at the Harvard Book Depository. Electronic access systems are critical to the successful operation of any high density storage facility. In a high density storage facility, there is no realistic possibility of direct user access via shelf browsing. High density facilities could save as much as three-fourths of the cost of conventional storage space.

If one uses accessibility and proximity as important measures, then the circumstances under which these facilities are effective become clearer. A high density facility is by definition closed to users and consists of rarely used materials; therefore, its location—or proximity—is not so important. Because of cost, there would be little point in a low density facility that was not also open (fully accessible) and strategically located for optimum use. Similarly, when cost is taken into account, medium density facilities should be at least relatively open, otherwise a high density facility would probably provide a better solution. There seems little value in a medium density facility that is inconveniently located from its users.

Given present technology, the relationship between accessibility and costs is a direct one: a higher degree of accessibility results in a higher cost, and vice versa.

A VISION FOR OHIO: CONCLUSIONS AND RECOMMENDATIONS

Ohio's academic libraries have grown and developed over the course of decades into a major information resource. They are an asset that reflects the diversity of academic programming in Ohio's colleges and universities, a diversity responsive to the educational needs of Ohio's citizens. This major resource is decentralized, except through the important linkage provided by the OCLC database.

The library survey and the capital requests for new or expanded library space tellingly mark the status of individual academic libraries in Ohio today. Their immediate and pressing space requests point only too clearly to the need for a library strategy for higher education that is visionary, collaborative, and space efficient.

It is apparent that a multifaceted, considered approach to the resolution of space need is demanded. With these important thoughts in mind, the Library Study Committee **recommends that the State of Ohio restrict construction of traditional academic library space and require public universities to explore and pursue solutions to library space problems other than the construction of conventional library buildings.**

Alternative Means of Storage

1. The Library Study Committee has reached the conclusion, based on its extensive analysis of developments elsewhere, that medium-density storage can be constructed for a little over half, and high density for about one fourth, the cost of traditional low-density storage (see Appendix E). The extremely low construction and operating costs of the Harvard Book Depository provide promising solutions to storage of infrequently used materials, freeing conventional shelf space for more active parts of the collection. These global cost data are so significant that the Library Study Committee believes that colleges and universities must begin immediately to develop strategies to incorporate medium and high density facilities into their library planning.

2. The Library Study Committee **recommends that where shelving or storage space is a problem, universities develop plans for use or construction of medium or high density storage space in either local or regional configurations and include those plans in their 1987 or 1989 capital improvement**

requests. These plans should include information about access and distribution and preliminary suggestions for removing rarely used items from existing library space to a high density depository.

3. The Library Study Committee **recommends that a high density facility be built at The Ohio State University with funds from the next biennial capital appropriation.** The facility at Ohio State should be available to assist other universities with their storage needs until further such construction in other locales is justified and completed.

   The Committee further believes that no more than three or four such facilities will be needed statewide in the next decade. The minimum capacity of each such facility should be on the order of 1.5 to 2 million volumes.

4. The Library Study Committee **recommends that the Ohio Board of Regents advocate and give priority to collaborative projects, such as regional high density storage, cooperative acquisition plans, and regional networks.** Where such projects would not be feasible because of location, scale, or mission, the Ohio Board of Regents should then consider more conventional solutions, but only under stringent review criteria.

5. The Library Study Committee **recommends the Ohio Board of Regents use the following criteria for evaluating capital requests for conventional library construction, rehabilitation of existing space, and construction of alternative storage or program space:**

   A. The Board should consider evidence from each institution:

      a. that library shelving or storage space has been or soon will be exhausted;

      b. that space for other primary functions has become extremely crowded (e.g. patron and staff space);

      c. that the institution's library storage problems cannot be relieved through collaborative approaches;

      d. that each institution is using or planning to use available high density storage for rarely used materials;

      e. that library storage or other functions have impinged on space built for classroom, office, or research purposes;

      f. that the libraries have made every reasonable effort, such as the reconfiguration or reassignment of space and the use of medium density storage, to make better use of existing space;

      g. that technological innovations do not provide an alternative to building additional space; and,

      h. that deterioration or obsolescence mandates the replacement of existing library space.

   B. The Ohio Board of Regents should also consider program criteria, such as:

      a. the number and level of graduate degree programs, along with the extent of research activity;

      b. the extent to which existing collections are already strong and the desirability of capitalizing on those strengths;

      c. the ability of some libraries to fulfill a major back-up role for other libraries, therefore (possibly) justifying both collection and building growth; and

      d. the ability of certain libraries to join fruitfully in collaborative acquisition and collection development programs.

Collaboration

Space limitations and storage needs for library materials prompted this study, and the foregoing recommendations suggest cost saving solutions to these urgent problems. But, as this report stated in the beginning, opportunity sometimes comes cloaked as a problem. The opportunity exists for Ohio to make a major qualitative leap forward for its academic libraries. The linking of library catalogs through an access network would, without the laying of

a brick or the purchase of a book, make **all** library holdings available to **each** library. With electronic access, the user's gateway to the state's library resources swings wide open. Such access would be a major step forward, and in the long run, statewide collaboration will, the Committee believes, change the pattern of library expenditures and limit the need for additional, conventional library space.

The Library Study Committee **recommends that the State of Ohio implement as expeditiously as possible a statewide electronic catalog system.** To the extent feasible, this statewide system should complement local systems and be accessible through them. Collaborative collection development projects, which should become considerably more practicable when this catalog is implemented, should be encouraged.

1. The Library Study Committee **recommends that the Ohio Board of Regents complete, within one year, a detailed five-year plan for implementing the statewide electronic catalog system.** The plan should include an analysis of the requirements for the system, a calendar for completing the necessary steps or phases, and a detailed cost study. This catalog should be fully operational among publicly-assisted academic institutions within five years. It should be made available (or accessible) within seven years to private college, large public, and other libraries that wish and are prepared to join the system.

2. The Library Study Committee **recommends that the State of Ohio fund the university librarians' plan for converting existing catalog records to machine-readable form.** (See Appendix F) This retrospective conversion is necessary to make the statewide online system fully effective and should, therefore, be completed in parallel with the statewide electronic catalog system.

3. The Library Study Committee **recommends the development and implementation of a statewide distribution system for library materials.**

4. **The Library Study Committee recommends that the Ohio Board of Regents develop an incentive plan to expand collaborative collection development projects that will, over time, strengthen the State's collections and lead eventually to space and cost savings.**

Technology

1. The Library Study Committee concludes, after its exploration of technology, that there are many developments on the horizon that will affect libraries in a very significant way. At this point, however, it is difficult for the Committee to assess the present nature and timing of the changes. It is clear that technology will not appreciably diminish the problem of storage at least within the next decade.

   Therefore, the Library Study Committee **recommends that the Ohio Board of Regents monitor developments in information technology which would affect the operations and services of the State's academic libraries.** Such monitoring will help the State plan for the effects of technology on future library operating and capital budgets. There will very likely be a period when libraries will have to bear the burden of paying for conventional services while simultaneously phasing in new technology.

2. In order to help understand and plan for developments in library technology, the Library Study Committee further **recommends that the Ohio Board of Regents initiate and fund with state, federal, or foundation money, studies and pilot projects to explore the uses of new library technology.** Approved projects should advance understanding of the short- and long-term effectiveness of the new technology. The projects should emphasize improved access and service to users. They should address, as well, matters of space, capital and operating costs, with the long-range goal of reducing the rate of increased library expenditures.

Preservation

The Library Study Committee recommends that **the Ohio Board of Regents develop a collaborative plan to address the serious issues of preservation of the content of brittle books in Ohio's academic libraries and the deacidification of more current materials to prevent their turning brittle.** A task force to conduct a collections condition study and prepare a remedial plan of action could draw upon the expertise of preservation officers already on library staffs.

Advisory Committee

The Library Study Committee **recommends that the Ohio Board of Regents designate a broadly based**

committee to advise, assist, and report regularly on the implementation of these recommendations. As the statewide system or structure begins to form, the Ohio Board of Regents or the State should establish a more permanent coordinating structure for the statewide, on-line system, storage facilities, and other collaborative academic library projects. The responsibility for instituting and overseeing the statewide system should not rest with any single institution, nor should any one institution determine the technology for the whole system.

SUMMARY

Before closing, the Library Study Committee believes it is important to share its sense of the advantages of the directions presented in this report. The key recommendations speak to highly efficient storage of library materials at strikingly lower costs, a major increase in access to all of the resources of Ohio's academic libraries, and pursuit of the promise of technological innovation. The urgency of meeting the storage needs of libraries has become a qualitative imperative which, given the limited capital investment funds available, can only be satisfied by an approach such as that described and recommended here. Each Ohio academic library will take a quantum leap as it taps the resources of fifteen million volumes through the proposed access system. This major qualitative move forward in access occurs along with **major cost avoidance** (through new storage and access options).

The Library Study Committee sees, therefore, not only an amenable solution to a vexing problem called storage, but a clear and present major opportunity for moving Ohio's academic libraries forward.

APPENDIX A

Summary of Library Study Inquiry of Ohio's State-Assisted Colleges and Universities

SUMMARY OF LIBRARY STUDY INQUIRY OF OHIO'S STATE-ASSISTED COLLEGES AND UNIVERSITIES

This Appendix contains a summary of the general trends and concerns expressed by the institutions responding to the Library Study Inquiry which was sent by the Chancellor to all Ohio state-assisted college and university presidents in November, 1986. In the Library Study Inquiry, institutions were asked to provide information about the following general topics:

1. Acquisitions Rates and Impact of Technology on Space
2. Patron Use of Facilities
3. Anticipated Need for Additional Space and Alternatives
4. Types of Collaboration/Network in Existence
5. Automation of Computer-Based Library Functions

Responses were compiled by the Library Study Committee in separate reports for two-year and four-year institutions. A comparison of the response by the two types of institutions shows similarity in certain areas, but more importantly a number of clear and fundamental differences both in regard to present conditions and concerns and in the changes envisioned for the future. This summary is a consolidation of these two reports, noting areas of convergence and divergence indicated by the responses.

Changes in Acquisition Rates and Impact of Technology on Space

Although both types of institutions projected growth in acquisitions, there were differences in the type and direction of such growth. The senior graduate research institutions expected great expansion in the area of traditional book and periodical holdings while community colleges envisioned a concentration more on the development of materials suitable for computer-assisted learning. Space needs for shelving were greatest in the larger institutions with extensive graduate programs, with many reporting that capacity has been or will soon be reached and exceeded. Both types of institutions agreed that modern electronic storage will require much less space, but that the equipment to use this storage (computer terminals, etc.) will in turn require much of the space saved. In general, it was evident that both present and anticipated space needs and problems were greatest among the large research libraries and least among the community colleges. Two-year colleges in general would require less space for growing collections than would graduate institutions. Also, the two-year colleges are often fortunate to have newer library facilities which have not yet had time to reach capacity.

All respondents felt that the development of online computer cataloging was highly desirable, and there has been much effort in this area. A universal concern, felt more acutely by the research universities, was the mounting cost of books and periodicals and the need for additional funding just to keep the current level of operations.

A great number of factors operate to determine the pattern of usage of library facilities in evidence at any particular institution. Among the factors identified in the response are the following, expressed as opposite pairs on a continuous scale:

1. Commuter/residential student population
2. Undergraduate/graduate student population and programs
3. Students, faculty, staff/general public
4. Open stack/closed stack access
5. "Traditional" reading/computer-assisted instruction, AV, etc.
6. Research activities/general class assignments, recreational reading
7. Low/high intellectual climate
8. Central/decentralized; specialized/general collections
9. Low/high convenience for patron use
10. Low/high level and variety of library services offered

All libraries attempted to provide maximum service within the constraints of physical facilities and budget, with emphasis on those services most needed by their particular clientele. Future projections by the universities pointed strongly toward increased use by graduate/professional programs and to priority development of computerized cataloging. The two-year colleges were concerned greatly with expanding usage and access by the public, especially by business and industry and with community outreach in general.

The large university libraries tend toward decentralization, thus dividing the clientele by subject and by level, while the community college and smaller university libraries will probably consolidate their position as central learning resource centers for the institution and community. The two-year college libraries also will tend to allocate a higher portion of their available space to computer-assisted and audio-visual instruction for self-paced learning.

Options for Limiting Space and Attitude Toward Remote Storage

This is probably the area where the problems, needs, and projections show the most difference between two-year and four-year institutions. In general, the largest concern for the four-year institutions was accommodating the present and projected volume of holdings. This problem is greatest with the large university research libraries and least with the largely undergraduate facilities, but all reported significant storage space problems. All institutions agreed that weeding of collections was necessary but could not sufficiently address the problem of space. Great expansion in electronic storage and search capabilities was seen as both necessary and desirable. Attitudes toward the construction of high density storage were most positive with the universities, mainly from admission of their necessity, and least positive with the community colleges because of their emphasis on user convenience and access. High density storage was generally seen as primarily a need for libraries committed to a large research collection, and reasonably convenient and efficient access and retrieval were demanded as a condition. Preference was for regional rather than statewide facilities.

There was general agreement on the effect of technological changes on space needs. Nearly all institutions felt that the expected growth in electronic means of storage, retrieval, and search, while greatly reducing the need for storage space, would at the same time increase needs for the necessary equipment and user space. In short, technological innovation was not seen as being able to solve the space problem by itself, as gains would be offset by losses. The general feeling was that, sooner or later, some type of high density storage capability would become necessary, first with the large research libraries and later with all libraries.

Types of Collaboration and Networking in Existence

All of the reporting institutions, both two-year and four-year, are currently involved in one or more collaborative network arrangements. Detailed tables and lists are included in both of the reports, and the networks are classified as to regional, statewide, interstate, and national. The four-year institutions are generally more involved with the national networks while the community colleges are concentrated on the regional or statewide networks. Especially notable is the great variety and number of networking arrangements in existence. It is also evident that these networks are by now a firmly established feature of all academic libraries and will no doubt continue to grow both in numbers and capabilities. All of the institutions, especially the smaller ones, recognize the need and advantages of collaborative efforts and are actively striving to expand in this area.

Automation of Computer-Based Library Functions

The reports contain detailed tables showing present and projected automation for the following functions: user catalog, serials control, circulation, fund accounting, and acquisition. It was obvious that automation of functions is to become standard to a great extent in all academic libraries, regardless of size. The four-year libraries are further along in present automation, but all institutions project conversion in the future in varying degrees. Automation will obviously assume an ever greater role in the operations of libraries in the future, though physical means of handling materials will probably always be used to some extent.

OHIO
BOARD
OF
REGENTS

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30 East Broad Street
Columbus, Ohio 43215
Telephone: (614) 466-6000

Memorandum

To: College and University Presidents

From: William B. Coulter, Chancellor

Date: November 3, 1986

Subject: Library Study Inquiry

As you know, the Board of Regents has been charged by the General Assembly with preparing a study of the state's academic library needs. This issue arose in the context of the capital plan, but the linkages that are inherent in the higher education budget will make it necessary for us to avoid a narrowly focused analysis. To illustrate, the legislation, Substitute House Bill No. 870, reads in part:

> "Appropriation item CAP-027, Library Study Planning, shall be used by the Ohio Board of Regents to conduct a study of the need for, and alternatives to, a significant expansion of space for state college and university libraries. In conducting the study, the board shall consult with state colleges and universities. It may employ consultants as required. A preliminary report shall be made to the Board of Regents by April 15, 1987. A final report shall be submitted to the Governor, Speaker of the House, President of the Senate, the minority leaders of the House and Senate, the Director of Budget and Management, and the Legislative Budget Officer by December 1, 1987."

It would be inappropriate to construe either "need for" or "alternatives to" in the very limited perspective of to build or not to build. The letter which Vice Chancellor Hairston sent to prospective Library Study Committee members expands upon this theme:

> "While the purpose of the study is a direct consequence of the need to make informed decisions on the capital budget, the scope of the committee's work will necessarily cover a broad range of issues affecting the operation of academic libraries. In particular, rapidly changing technologies and concomitant changes in the conceptual approaches to information storage and retrieval will require careful examination."

The committee which we have charged with this task has just completed its second meeting. The principal decision emerging from this discussion is that there is a need to have a much clearer idea of the library-related problems, as well as the plans for dealing with them, which are extant or perceived to be imminent in our colleges and universities. While it seems prudent to tie our

inquiry to the capital budget process, we want both to look further ahead and to go beyond the very limited statistical kind of inquiry normally associated with such plans. The attached inquiry is, therefore, rather open-ended. Indeed, we hope that you will choose to respond with something more akin to an essay illustrated with facts or projections rather than with a series of unfiltered data.

In any case, we trust that you will appreciate the seriousness of purpose that transcends the format of the inquiry. This is an issue that effects everyone concerned with higher education in a fundamental way: the choices which we make now for both libraries and information management will importantly define our options in these and related areas for a decade or more.

Our timeline is regrettably short, but the timetable with which we are working, and the legislative deadline from which it is derived, leave us no choice. We do appreciate the receipt of your response by November 26th. Thank you very much for your help.

Enclosures

Survey documents
Library Study documents

POSSIBLE OUTLINE FOR RESPONDING TO LIBRARY STUDY INQUIRY

Introduction/Overview

What are your overall expectations for library development in the two time periods? What major problems and solutions do you foresee?

1. Acquisitions

A. What are the principal factors which determine your institution's acquisition strategy? (If you have a written policy governing acquisitions, please append it.)

B. Do you anticipate important changes in your acquisition rate in the two time periods? If so, in which areas (e.g. government documents, periodicals) will the changes be most significant?

a. What effect would you expect these change(s) to have on the need for storage space? For other space?

b. Describe the technological changes which you believe will be in effect in these time periods, and indicate the manner in which you would expect these to affect the space needs noted above.

2. Library Use

A. Describe the manner in which your library(ies) is now used. Are some facilities dedicated to specific uses—for example to undergraduate students, to faculty and students in a single discipline or group of disciplines?

B. Do you anticipate important changes in patron use of your library facilities in these time periods? Will different groups (e.g. faculty, undergraduates, graduate students) be affected in different ways? Do you expect that other constituencies (e.g. business and industry) will make greater use of your facilities? If so, how will this change the pattern of use?

a. What effect would you expect these change(s) to have on the need for storage space? For other space?

b. Describe the technological changes which you believe will be in effect in these time periods, and indicate the manner in which you would expect these to affect the space needs noted above.

3. Management of Space

A. What options (e.g. weeding) do you consider to be available and feasible (less than the cost of the space saved) for limiting the space needed for your current collection? What has been your experience with these to date?

B. What percentage of your collection can be described as rarely used? How do you define this level of use?

C. What advantages or disadvantages would you foresee as a result of the use of remote storage as a strategy for managing space? "Remote" in this case is defined as accessible no sooner than twelve hours and no later than twenty-four hours for books, most documents and articles, and two hours or less (but at some charge) for articles maintained on-line (or substitute your own definition).

D. Describe the technological changes which you believe will be in effect in these time periods, and indicate the manner in which you would expect these to affect the space needs noted above.

4. Networking/Resource Sharing

A. Does your library now have in place any cooperative strategies for acquisition and/or retention of materials? If so, how would you describe your experience to date? (It is assumed that you are active in the use of interlibrary loan, but we would like to know if you are employing this system in any way which is particularly relevant to the objectives of this study.)

B. Looking toward the two time frames encompassed by this study, what additional or alternative strategies for networking/resource sharing are you or will you likely consider? If you would expect to explore a formal network or consortium,

which do you believe might be most feasible for your college or university: 1) an intrastate and statewide network; 2) an intrastate but regional network; 3) a multi-state network; 4) another approach?

5. Preservation

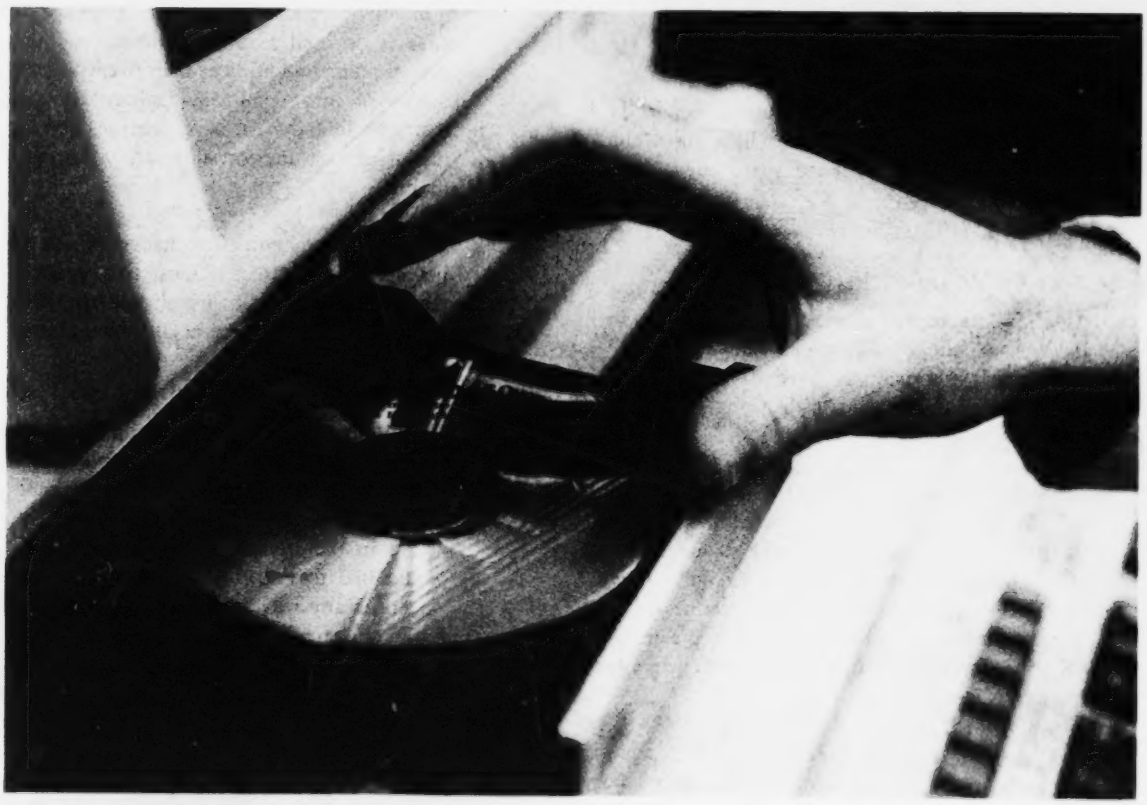
To what extent is the preservation of existing materials now a concern for your library? How is this likely to change in the stipulated time periods? What effect do you expect that the issue of preservation will have on your space needs?

6. New Facilities

Do you project the need for new facilities in the two time periods? (Describe those already proposed to the Regents only very briefly; provide a fuller explanation of plans for the others.) What strategies would you implement if funds for these buildings were **not** forthcoming?

7. Summary

Please recall that this is only an outline of suggestions—if there are other issues or concerns which you would like to address, please do so. Again, as emphasized in the cover memorandum, the objective of this inquiry is to evoke your thoughts as to the best means of meeting your college or university's goals for achieving excellence in library and information services.



OHIO BOARD OF REGENTS
LIBRARY STUDY COMMITTEE
BASIC DATA FORM

RESPONSE DUE NOVEMBER 26, 1986.

INSTITUTION: / CAMPUS:[1] _____ / _____ RESPONDENT: _____

Acquisitions and Budget Information — In the space provided in the grid below, please specify data regarding acquisition rates and budgetary commitments from 1975-1985.

LIBRARY ACQUISITION AND BUDGET INFORMATION FOR 1975-1985

	Library Collection Acquisition Rate				Current Serials Subscriptions	Total Microform Units Held	Interlibrary Loans		Budget Information	
	Volume in Library (at Beginning of Year)	Volumes Added (Gross)	Volumes With-drawn	Volumes Added (Net)			Items Shared	Items Borrowed	Amount of Total Library Budget[2]	Library Budget as Percentage of Total Instructional & General Budget
									$	%
1975-76[3]										
1976-77										
1977-78										
1978-79										
1979-80										
1980-81										
1981-82										
1982-83										
1983-84										
1984-85										

[1]*This form should be completed for each college campus.*
[2]*This includes total library budget, including personnel (with fringe benefits) acquisitions, and related supplies and services.*
[3]*July 1 — June 30.*

LIBRARY STUDY COMMITTEE
Basic Data Form
Page 2

GENERAL INFORMATION

1. Please indicate the total number of department/subject libraries at your institution (excluding branch campus libraries): _____

2. Please specify the total number of patrons which can be seated in your library(ies): _____

AUTOMATION INFORMATION

3. Which in-house library functions are currently automated (computer based)? Please specify system — turn-key brand name or local:

   Catalog _____ Circulation _____ Acquisition _____

   Serials Control _____ Fund Accounting _____ Other: Specify _____

4. Which in-house library functions do you plan to automate in the future, and in what time frame?

   Catalog _____ Circulation _____ Acquisition _____

   Serials Control _____ Fund Accounting _____ Other: Specify _____

COLLABORATION

5. Does your institution participate in any of the following types of collaborative activities to enhance the resources/services of your library? Please indicate name of network.

   Regional Network _____ Statewide Network _____ Interstate Network _____

   National Network _____ Other: Specify _____

6. Do you have future plans for new collaboration affiliations which will enhance the resource/services of your library? Please describe type of affiliation and future time span:

   _____

   _____

APPENDIX B

Reports:
Site Visit
University of California,
University of Illinois, and
Harvard University

LIBRARY STUDY COMMITTEE
UNIVERSITY OF CALIFORNIA SITE VISIT REPORT
JANUARY 27-30, 1987

Site Visit Team Members:

Ed O'Neill, Charles Ping, Ned Sifferlen, Don Tolliver, Matt Filipic, Elaine Hairston, and Pat Skinner.

Purpose of Visit:

The major purpose of the site visit was to view and discuss the development, implementation, and operation of the California Northern Regional Library Facility, built in 1982 and located in Richmond, California. Team members visited the Richmond facility and met with faculty members, librarians, and administrators on the University of California-Davis and Berkeley campuses. In additon, Elaine Hairston visited the Southern Regional Library Facility located on the UCLA campus; however, since that Facility has not yet been opened, this report will focus on the visit to the Northern Regional Storage Facility.

Meetings Were Held With The Following Individuals:

—Allan Dyson, University Librarian, Santa Cruz campus

—Joseph Rosenthal, University Librarian, Berkeley campus

—Ria Kane, Associate University Librarian, Berkeley campus

—Professors Brentano (history), Slottman (history), Devogelaere (math), and Starr (English), Berkeley campus

—Marilyn Sharrow, University Librarian, Davis campus

—Selected faculty and other staff, Davis campus

—Gloria Stockton, Director, Northern Regional Library Facility

—Michael Buckland, Assistant Vice President, Library Plans and Policies, University of California

Background Information:

The Northern Regional Library Facility (NRLF) is a co-operative library storage facility, the first of its kind in California. The concept of a remote high density storage library facility for California was developed and recommended in *The University of California Libraries: A Plan for Development* (1977). The purpose of the Facility is to store, preserve, and provide access to low-use materials of research value in a cost effective manner for libraries in Northern California, including those of the University of California campuses at Berkeley, Davis, San Francisco, and Santa Cruz. Though these libraries are now and will continue to be the primary depositors to the Facility, others will be able to participate by arrangement.

With the exception of the University of California libraries, depositing libraries are assessed on a cost recovery basis for services provided by the Facility, such as processing and housing of materials, together with the associated administrative costs.

The Facility is managed and operated by the University of California. It is governed by the Northern Regional Library Board, which is appointed by and responsible to the President of the University of California.

Ownership of material is retained by each depositing library. In order to assure maximum and economical use of the Facility, it is expected that material deposited is intended for permanent storage.

Each depositing library is responsible for providing a machine-readable bibliographic record for all book and booklike items deposited. Primary access to material on deposit at the Facility is provided by lending and photocopy services which individuals secure through their own libraries. Access is also provided by on-site service to individuals.

Description of the Facility:

The Northern Regional Library Facility is located at the University of California, Berkeley's Richmond Field Station in Richmond, California, 7 miles from the Berkeley Campus. The 98,000 square foot building was completed in October, 1982 and began operation in 1983. The building has staff and reader space as well as

stack space. The stack component provides capacity for over 3,000,000 volumes, and as of June 30, 1986 there were over 2,200,000 volumes stored in the building. The building is designed to permit construction of new stack components as the need for additional space develops, with a potential capacity of 11,000,000 volumes. Staff at the Facility receive, process, and create machine-readable records for newly-deposited materials, which amount to more than 250,000 volumes per year, and provide circulation services on over 50,000 items per year.

To maximize the capacity of the Facility, materials are stored in the stacks by four size classifications in the order in which they are received. This means that in many instances subject area collections, and even runs of single journal titles, may not be shelved together. As an additional space-saving measure, books are placed two-deep on each shelf. The materials of different depositing libraries are often intershelved. However, non-University of California deposits are not intershelved with University of California deposits. A high security area is available for special collections.

The shelving capacity is about 58 miles (more than 35,000 shelves). The building cost was $8.7 million and the estimated annual operating cost (facilities maintenance, personnel, automation and computing equipment, supplies, etc.) is $1,062,000. The operating cost estimate does not include transportation of requested materials to campuses, however. Most of this function is performed by an existing jitney service which carries people, books and mail among the nine University of California campuses.

Based on extensive discussions with a variety of individuals in California, the committee learned about the advantages of remote high density storage as well as some possible issues to consider in planning and developing such facilities. These advantages and issues are outlined below.

Advantages of Remote High Density Storage:

1. A high density facility provides the capacity to store a much larger quantity of materials more economically than would be possible with a traditional library building. Comparative costs are approximately $3 per volume versus $20 per volume.
2. High density storage is probably the only way ultimately to contain the growth of collections. Weeding, electronic automation, and building additions are necessary and helpful, but cannot solve the problem.
3. A shared storage facility has the advantage of offering access to major library research collections not formerly available to other libraries.
4. A high density storage facility can provide environmental controls for materials preservation as well as fire and theft protection systems.
5. Electronic access to the collection in storage can make stored materials readily available to users.

Issues of Consideration Regarding Remote High Density Storage:

1. Requiring each library to commit a specific number of volumes for storage can result in pressures to store active parts of the collection.
2. Deciding which materials are candidates for storage must be carefully done. If frequently used materials, or substantial portions of collections in a single discipline, or materials with insufficient records are stored, they can deter access to information, a key library responsibility.
3. Adequacy of bibliographic records must be assured, including retrospective conversion.
4. Browsing of materials is not feasible.
5. Utilization of materials on the site requires setting up transportation systems.
6. Inaccessibility and lack of browsing opportunity may have a negative effect on scholarly activity by students and faculty.
7. Operational costs of remote facility operation need to be reviewed carefully.
8. Cost of transportation of materials may be greater than expected.
9. Storage of multiple copies of some materials can reduce efficiency and cost advantages of remote high density facilities.

LIBRARY STUDY COMMITTEE
UNIVERSITY OF ILLINOIS SITE VISIT REPORT
FEBRUARY 10-11, 1987

Site Visit Team Members:

Fred Carlisle, Roger Clark, Elaine Hairston, Duane Rogers, Patricia Skinner, William Studer, and Don Tolliver.

Purpose of Visit:

The specific objectives of the site visit to the University of Illinois were: (1) to learn about the statewide automated computer library network system now in operation (LCS), (2) to learn about the statewide Cooperative Collection Development Committee and its work, and (3) to examine the Library's compact storage facility, the Sixth Stack Addition. Team members visited the facility, met with representatives of the central administration and the library staff, and attended a series of presentations and discussions on present library operations and future plans.

Meetings Were Held With The Following Individuals:

—Steve Rugg, Associate Vice President, Planning and Budgeting

—David Stewart, Assistant Vice President, Planning and Budgeting

—Bernard Sloan, Manager, LCS User Services

—Sharon Clark, Automated Systems Librarian

—Ruth McBride, Circulation Library and Assistant Director of General Services

—Dale Montanelli, Director of Administrative Services of the Library

—Anthony Aniello, Associate Vice President, Administrative Information Services

—Barton Clark, Director, Departmental Library Services and Professor of Library Administration

—Bridget Lamont, Director of the Illinois State Library

—Kathleen L. Bloomberg, Associate Director of the Illinois State Library

Library Computer System (LCS):

The Library Computer System, a local short-record circulation system originally developed at The Ohio State University, provides the State of Illinois with one of the most powerful and comprehensive resource sharing systems in the nation. The Full Bibliographic Record (FBR) is the electronic online catalog component of the Illinois library resource sharing system. It has now expanded to include 29 academic libraries holding a total of 10 million records and 85 million volumes, the largest resource sharing pool of currently held materials yet developed in any state. This system, maintained by the University of Illinois Office of Administrative Information Systems and Services (AISS), provides member libraries with both local and interlibrary searching and circulation capabilities. By July, 1987, all participating libraries will be able to use the catalog to search the records of the more than 290 OCLC/ILLINET member libraries throughout the state. This network is currently accessible from over 750 terminals, with further expansion planned. Approximately 750,000 volumes are loaned within the system annually, with operations controlled by computer at the medical campus of the University of Illinois at Chicago. Dial access terminals are provided on campuses as well as at remote locations (telephone access is also available for out-of-state users), and the automated system includes self-charging. Courier service promises delivery anywhere in the state within two to ten days, depending on the distance and connections. A key element in the development of the system has been the retrospective conversion of materials to machine-readable form, and participating libraries have already converted records representing 9 million volumes. So far, this conversion has been limited to materials dating back no further than 1975, however.

There are now plans to develop an online catalog, with different, but linked, software, which can provide all participating libraries with full bibliographic records capable of being connected to a short circulation recorder. This system would operate out of the University of Illinois medical campus and include all OCLC records derived from all Illinois libraries using the OCLC sys-

tem, and would have capability for both key word and subject searches.

Advantages:

1. Resource sharing will develop interlibrary cooperation and avoid duplication of effort.

2. The entire state would benefit, including both academic and general libraries (members of ILLINET), establishing a "superlibrary" of statewide resources.

3. Automation would provide greater efficiency in local circulation operations by replacing manual methods.

4. The general rapid escalation of acquisition costs would be offset significantly.

5. LCS would provide the foundation (terminals, communication network, etc.) for the development of a complete online catalog.

6. Impetus would be added for cooperative collection management activities by:

   a. facilitating study of potential areas for cooperative endeavors because of the machine-readable database
   b. providing quick access to materials by all participants.

7. State government and political leaders have shown strong commitment for supporting the development and continued operation of the system.

Areas of Consideration:

1. In several respects LCS has reached the limit of what it can be with current funding. Additional financial support would be required to support more terminals and member libraries.

2. The basic LCS software is 16 years old; though it is now working well, it has certain inherent difficulties:
   a. Because it was developed in an earlier era, it requires very highly skilled programmers and much time for maintenance.
   b. New automation developments, which users now expect, would be difficult to incorporate into the system.

3. Though the successful statewide interlibrary operations are commendable and enviable, there is a continued need to balance their development with that of local circulation needs.

4. Retrospective conversion so far has been confined to materials dating back only to 1975 for the Urbana-Champaign campus. However, the majority of LCS libraries have completed retrospective conversion of all materials. Commitment of time, personnel, and funds would be necessary to provide expansion in this area.

Cooperative Collection Development:

A statewide Cooperative Collection Development Committee was instituted in 1984, funded by HECA seed money granted for activities in this area. The Committee so far has compiled information on the quantity of all library collections in the LCS system and is now developing a quality indicator evaluation mechanism based on one previously developed by the Research Libraries Group.

Current plans center around a series of consecutive and interrelated projects that were developed by testing various pilot projects. Successful projects are then incorporated into a master plan of phased activities leading to a voluntary cooperative collection management plan for academic libraries in the state. The stated objectives are:

1. to continue testing and development of pilot projects

2. to complete and expand the LCS collection analysis quantity matrix to include libraries with machine-readable databases other than LCS

3. to develop and implement a series of subject-oriented acquisition projects based on needs determined after evaluation of the strengths and weaknesses of existing collections

In its first year of operation, the Committee developed a collection analysis matrix of LCS holdings indicating the number of titles held in each participating library, broken down by the 489 subjects used in the National Union Shelflist, and conducted training of subject specialists in methods of applying standard quality indicators. Continued efforts have resulted in expansion of the analysis matrix, further subject specialist training, and

the development of mechanisms for evaluation and acquisitons.

Advantages:

1. This effort represents an innovative approach to maximizing funds for special acquisitions while developing high quality collections for statewide use.

Areas of Consideration:

1. The relatively great amount of time necessary to achieve the stated objectives could at some time in the future raise a question of commitment to continued funding.

Compact Storage Facility:

The University of Illinois's compact library storage facility, the Sixth Stack Addition, was added to the main campus library at Urbana/Champaign in 1983. The original library building was built with provision for additional stack facilities, and five additions have previously been constructed. As the existing capacity had been essentially exhausted, and with acquisitions running approximately 200,000 volumes per year, the need for additional stack space was obvious. After considering the various options available for meeting this need, the University decided to build a compact storage addition. The facility, a nine-tier stack featuring a mobile shelving system and complete environmental control (including both air and light filtering systems), was built at a total cost of almost $7 million for building and equipment. It contains almost 55 miles of shelving, housing over 2 million volumes. Unlike a completely "compact" storage facility, the Sixth Stack Addition houses books in classification number order, requiring vacant space on shelves for future acquisitions. Though this mitigates the maximum possible density somewhat, the holdings still occupy only 8,529 square feet of site area and the cost per volume is $3.36, compared to $4.89 for a stack addition with fixed shelving. Capacity is about twice that of a conventional facility.

Since the facility is situated adjacent to the University library, it was decided that some density should be sacrificed to provide a limited degree of "browsability." Selected undergraduates, graduate students, and faculty have browsing privileges, though there are no carrels or work areas in the facility itself. Undergraduate students do have full electronic access, however, through online computer search using the LCS and the newer online catalog (FBR), which includes both key word and subject search capabilities.

Advantages:

1. The facility is the product of a carefully conducted systems management approach, and is custom-designed for compact, mobile storage featuring a high degree of accessibility and convenience.

2. The location (on the campus and as part of the library building) encourages access by both faculty and students (either physically or electronically).

3. The high-density storage is cost effective, requiring no additional personnel and limiting additional costs to maintenance and overhead.

4. There are no delays in movement of materials since the building is an integral part of the library.

5. Mobile shelving, while expensive, gives greater flexibility and complete user access while still maintaining a high degree of density.

6. The type of construction for the building provides maximum fire protection. Environmental controls ensure preservation of materials to the greatest degree possible.

Areas of Consideration:

1. Electronic driven shelving can be immobilized by breaks in electric service, thereby preventing access to the holdings.

2. Only one aisle is accessible at any one time. This does not pose great problems in a "closed stack" library, but might in an "open stack" situation.

LIBRARY STUDY COMMITTEE
HARVARD DEPOSITORY, INC. SITE VISIT REPORT
FEBRUARY 11, 1987

Site Visit Team Members:

Helmut Alpers, Ken Baker, Elaine Hairston, Georgia Lesh-Laurie, Dale McGirr, Pat Skinner, and Bill Studer.

Purpose of Visit:

The major purpose of the site visit was to view and discuss the development of the Harvard Depository, Inc., a new off-site library storage facility completed in June, 1986. Site visit team members also had an opportunity to see the compact storage shelving in the Widener Library, which is the same type of automated shelving utilized by the University of Illinois.

Meetings Were Held With The Following Individuals:

Richard Fryberger, Assistant Director of Planning, Harvard University

Barbara Graham, Assistant Director of University Libraries for Financial Planning and Special Projects, Harvard University

Sandra Coleman, Deputy Director, Harvard Law Library

Carol Arvin, Facility Manager, Harvard Depository, Inc.

Background Information:

The Harvard University library system comprises approximately 90 autonomous libraries (e.g., Law Library, Education Library, etc.) which contain a total of 11 million volumes. In 1983, formal recognition was given to the growing space demands for library materials, with the development of plans for a new type of storage facility which would be particularly suitable in an academic environment with a decentralized library system. The University central administration made an initial investment to build a warehouse type storage facility, to be utilized on a voluntary, leased-space basis. This facility, the Harvard Depository, Inc., (HDI), was opened in June, 1986. To date, materials stored include those from University Archives and the Schools of Business and Law.

Description of the Facility:

The Harvard Depository, Inc., is an off-site high density storage facility which combines filing, retrieval and delivery services to allow economical storage of low-activity library books, boxed materials, and administrative or academic records. This facility is a wholly owned subsidiary of Harvard University, managed by Iron Mountain Group, Inc., a professional records management firm.

The Harvard Depository, Inc. is located on a six-acre site in Southborough, Massachusetts, and will be constructed in phases as depositor needs increase. The first phase (the building the team visited) includes 165,000 linear shelf feet. Future expansion plans include space for 10 additional phases.

Phase I consists of 3,500 square feet of office and administrative area and 8,500 square feet of storage space. Space has also been allocated for a reading room for scholars. Two additional general purpose rooms can be used for meeting space or areas where special collection-management projects can be conducted. The storage building is approximately three stories high inside and contains metal shelving configured from floor to ceiling. The shelving is accessed through mobile mechanical lifts (i.e., industrial-type "cherry picker").

The Harvard Depository, Inc. is designed with three types of protection for materials: (1) physical protection from damage by fire and water or loss by theft or neglect, (2) environmental protection from deterioration by exposure to light or to an uncontrolled climate, and (3) protection from inventory loss through misplaced or mismanaged materials.

Depositors of materials are charged separately for storage, retrieval, and delivery. The types of materials recommended for storage in this facility include library books and archival and museum collections where the usage pattern is low.

Further details regarding the facility are included in Attachment A, appended to this report.

Depositor Perspective

In order for the team to understand how the Harvard Depository, Inc. is viewed and utilized by representatives of the Harvard University Library system, a discussion was held with the Deputy Director of the Harvard Law Library. The Law School Library was one of the first individual libraries at Harvard to store materials at HDI. It has 7,600 volumes (1,090 book feet) stored at the facility to date, out of a current library collection of 1.5 million volumes.

Decisions regarding which materials to store were made earlier, as 60% of the materials sent to the Depository had already been in storage in a dormitory basement. Thus, 60% of the stored materials were not browsable by the faculty before being moved to the Depository. Since September, 1986 there have been five requests for materials to be returned to the campus library. It was generally felt that materials would be more accessible from the Harvard Depostory, Inc. than they were previously. In addition, materials had been stored in very poor climatic conditions with little or no formal records.

Advantages

1. The cost of building this facility is very inexpensive (approximately $1 per volume of books stored), significantly less than either the California Northern Regional Library Facility or the Illinois Sixth Stack Addition.

2. There is a "buying into" the facility with the use of a cost center concept—each library wanting to use the storage facility must agree to pay for the space from its own budget. There is also a processing charge for having books returned to the central campus library.

3. Since Harvard Depository is managed by an external records management firm, all libraries storing materials are treated "equally" as customers. To date, space is being provided for Harvard University materials; however, plans are being made to store materials from the Massachusetts Institute of Technology in the near future.

4. Operation of the facility appears to be very low cost, with only 3-4 staff required for 2 million books.

5. Retrieval of needed materials appears to be efficient and effective.

6. The key to efficient storage appears to be the strategy of filing books by size, adjusting shelves, and storing a multiplicity of items, including archives, art works, records, and books.

Areas of Consideration:

1. Physical browsing is not possible.

2. The idea of remote high density storage may not be acceptable to all faculty and/or staff.

3. Preparing books in poor condition for storage can be a problem.

4. If expanded access of stored materials is desired, plans must be made for their circulation beyond the return of materials only to the library which initially housed them.

5. Careful planning and attention must be given to the design of the facility in order to maximize the potential high efficiency/low cost benefits.

Attachment A
HARVARD DEPOSITORY

Concept

This single satellite depository, located 30 minutes from the main campus and featuring next day delivery, permits campus libraries to store their lesser used collections to relieve immediate and future space problems. The Depository is a new library building type, having some characteristics of a warehouse, but featuring the careful integration of a highly specialized building system, shelving system, computer systems, and operating plan for library materials. This concept constitutes a break-through both in terms of cost and of quality in comparison to existing libraries conceived for the same purposes.

Cost and Capacity

The Harvard Depository Phase I will accommodate 1,700,000 books for a project cost of $1.8 million, or approximately $1/volume, with a total of $2.2 million when financing, land and other costs are included. This is 1/10th the cost of a Pusey Extension, 1/6th the cost of Yale's Seeley G. Mudd Storage Annex, and 1/3rd the cost of the California Northern Regional Facility.

Book Conservation

The Harvard Depository provides an excellent conservation environment, with carefully controlled limits of temperature (±3°) and humidity (±3%) at very low costs. Temperature and humidity will be changed in a gradual manner as the seasons change.

Harvard Depository Description

1. In its first library application, the depository employs specially adapted high-bay shelving (6′ wide, 30′ high, and 175′ long) within a most cost effective and specially adapted single story building in conjunction with a support building providing work and user spaces. Rather than having multiple levels of lighting and mechanical air distribution ducts, elevators, fire stairs, and other building elements, the Depository features an unobstructed stack configuration in a single, simple space.

2. A book container system was invented in five modular sizes to allow much greater density, because books are shelved not only by height but by width. Prevously, deposit libraries have only been able to increase density by shelving books of the same height together.

3. Importantly, these book trays enable 36-inch-deep shelves to be used rather than conventional 9-inch ones. Book trays are pulled out at right angles to the axis of the shelving and are shelved double deep, one behind another. A computerized inventory control system has been incorporated, using barcode labels for all items, programming the workload sequence and virtually eliminating lost books. The barcodes can be read rapidly by a laser gun scanning the book tray.

4. To provide shelving access, a commercial, manually-operated order-picker is used, providing complete vertical and horizontal mobility for a work station (8′ long X 40″ wide). With this mobile work station, the book-tray shelving approach is easily workable, allowing books to be accessed quickly with minimum effort and no abuse.

APPENDIX C

The Book Deterioration Crisis

THE BOOK DETERIORATION CRISIS

Introduction

One of the written goals and objectives of the Ohio Conservation Committee (OCC) is "to pursue development and funding for an Ohio mass deacidification facility that would primarily serve not-for-profit Ohio institutions." For almost two years the OCC Subcommittee on Mass Deacidification, under a charge by the OCC Chairman, has been studying the options and opportunities available to Ohio libraries for establishing a mass deacidification facility in Ohio.

The recent appointment by the Ohio Board of Regents of a Library Study Committee to investigate the need for and alternatives to a significant expansion of space for state college and university libraries presents an opportunity for OCC to urge that its preservation and conservation concerns be considered by the Library Study Committee. It is understood that this Committee's work will also include, beyond space needs, issues involving changing technologies and approaches to information storage and retrieval.

The Mass Deacidification Sub-Committee of OCC believes that mass deacidification is important to preserve the written cultural and intellectual heritage contained in Ohio's libraries. Steps must be taken to ensure the longevity of paper materials which are highly acidic and will eventually, through embrittlement, be rendered useless if not treated. It is the Sub-Committee's belief that mass deacidification needs wide support to make this preservation process part of the State's commitment to the collection, storage, and preservation of its library resources.

Nature and Extent of the Problem

The large-scale deterioration of book collections in the United States is a quiet crisis that threatens to destroy a substantial portion of the nation's printed cultural and intellectual heritage. It is a crisis that is rapidly receiving its due recognition as one of the critical issues facing research libraries today.

The alarming results of book condition surveys conducted at major research libraries, such as those at Yale University and the Library of Congress, have been widely reported and their implication acknowledged by university administrators, librarians, and archivists across the country. These studies revealed that substantial portions—from one-fourth to over one-third—of the collections surveyed are so severely deteriorated that they are already brittle and are rendered too fragile to be used. Larger portions of materials in existing collections are examples of acidic paper and are on their way to becoming embrittled, if they are not treated to arrest that decay process.

Paper acidity is the most important predictor of its longevity. It has been well-documented that the causes of "acid attack" are internal to the paper itself. Around the middle of the nineteenth century a change in papermaking technology resulted in the use of wood pulp in place of rag content and the increased use of chemical additives. In the past 125 years, alum rosin sizing has been routinely added to wood pulps in the papermaking process to enhance the printability of the finished paper. It is this sizing itself that leaves the destructive acidic residue.

Due to this combination of factors producing acidity, most of the books and documents produced between roughly 1870 and 1930 have now deteriorated to an embrittled state. A large portion of more recent imprints—as high as 90 per cent, as estimated by recent surveys—including most materials that are currently being used by libraries, are definitely acidic, although they have not yet become embrittled. However, if these newer, post-1930 materials are not treated to neutralize the residual acids, their self-destruction will continue toward irreversible embrittlement in the latter years of this century and the early years of the next century.

Solutions to the Problem

Stated most simply, the paper-based books and documents of the past 125 years must be reformatted to a stable medium (e.g., microfilm), or their acidic chemistry must be neutralized (i.e., "deacidified") if the contents are to be preserved.

A limited range of solutions exists for approaching the problem. Essentially, materials can be replaced, reproduced or treated to arrest further decay. Those which have deteriorated beyond use can be replaced, if reprints are available, but at a cost usually in excess of the original volumes. This option applies to only a small portion

of endangered materials, for the marketplace seldom encourages publishers to invest in the reprint business.

Embrittled texts are routinely reproduced by libraries or microfilm publishers through microfilming, thereby preserving their intellectual content and forfeiting (usually) the physical book format. Significant numbers of important texts from the era of bad paper have been and are being preserved on film by major research library cooperative efforts. Microfilming is currently considered the most appropriate, cost-effective method for the preservation of embrittled texts. Nevertheless, the cost of microfilming is considerable, at around $40 to $60 per 300-page volume.

Materials not yet embrittled can have their acidity neutralized using a single-item manual process (using dip tank or spray deacidification methods), or deacidification can take place en masse. The former is a costly, labor-intensive procedure and as such is generally reserved for small numbers of rare and special items. It is mass deacidification only, a process of bulk neutralization, that holds for libraries the promise of an affordable method for the large-scale preservation of books in their original formats.

THE CRISIS IN OHIO

Ohio's library, archival and historical society collections hold the documentary heritage of the state and provide many well-known collections of national significance. The holdings of Ohio public and academic libraries are over 57,303,324 volumes and are growing at the rate of 3,543,057 volumes per year.[1] The holdings of Ohio's college and university libraries alone number over 25,000,000 volumes.

To determine the extent of book deterioration among two of these collections, random sampling was done recently in the libraries of Ohio State University and Kent State University. These studies revealed, through remarkably similar results, that around 22% of the collections sampled are embrittled and 87% or more are moderately to severly acidic. If the brittle books (22%) are subtracted from the total that are acidic (87%), it can be roughly estimated that at least 65% of these collections are acidic but not yet brittle.

[1]State Library of Ohio, *Statistics of Ohio Libraries, 1986.* (Columbus, Ohio, 1986).

If these percentages are applied to the total holdings of Ohio academic libraries, we can estimate that in the libraries 16,000,000 volumes, though currently usable, are endangered because of their acidic paper. At the projected mass deacidification cost of approximately four dollars per volume, the cost to the state of preserving its printed heritage, barring inflation, could exceed sixty-five million dollars.

As expected, Ohio's libraries have a lower number of brittle books than Yale University and the Library of Congress, due to the younger age of Ohio's collections. However, the high percentage of materials that are acidic but not yet brittle, and as such are potential candidates for deacidification treatment, make Ohio an ideal location for a deacidification facility.

While it may not be necessary for any Ohio library to treat all of its acidic materials, neither can these libraries afford to allow their valuable collections to deteriorate. The urgency of the deterioration crisis and the potential of mass deacidification treatment for those materials not yet embrittled create an opportunity for cooperative preservation planning among Ohio's libraries.

The Promise of Mass Deacidification

Mass deacidification, a vapor-phase process by which books and documents can be acid-neutralized in bulk under pressure, offers the most promising and inexpensive approach for the preservation treatment of large collections of non-brittle materials. At this writing the choice of mass deacidification processes is limited. The diethyl zinc method (DEZ) developed by the Library of Congress is being tested and will be operational in 1988. (The DEZ test facility, constructed by the Library of Congress with assistance from NASA, has experienced some technical setbacks, which are being resolved.) Another process in the U.S. has been developed by the Koppers Corporation, which to our knowledge has not been tested. Also, England and France both have mass deacidification processes in the planning stages.

The only mass deacidification facility now in successful operation is the prototype Wei T'o facility at the Public Archives of Canada in Ottawa. This facility has been operating since 1980, treating only materials from the Archives' own collections.

The Wei T'o system uses an organic magnesium carbonate for its deacidification agent, dissolved in a fluo-

rocarbon and alcohol carrier. The deacidification agent and solvents are forced into the books under pressure. At the end of a fifty-minute cycle, solvents are removed from the books by vacuum drying. In Canada, the system meets safety standards equivalent to OSHA standards in the United States. This process can extend the life of a book as much as 300 to 500 years, depending upon the book's subsequent usage and storage conditions.

While Wei T'o mass deacidification facilities are under consideration in several states, no state is yet constructing such a facility. Thus, it is reasonable to assume that these facilities will not be widely distributed or easily accessible to most libraries for many years to come.

The Relationship of Mass Deacidification and Collection Management: Opportunities for Collaborative Efforts

The link between preservation and collection development and management is becoming increasingly apparent as the library profession examines the issues of the deterioration of vast portions of its collections. Author Dan C. Hazen has pointed out that there is an analogous structure between the decisions inherent in collection development and preservation. In collection development librarians decide which materials are important to acquire, while in preservation, they decide which materials least deserve destruction.[2]

Although mass deacidification technology may make moderately-priced treatment for acidic materials available to research libraries in the near future, the sheer volume of need will make the cost of wholesale treatment of collections prohibitive. Not only do materials currently held by Ohio's libraries need treatment but, well into the foreseeable future, new acquisitions will arrive on acidic paper and require treatment. The enormity of the preservation challenge demands that action be taken, but the potential costs of any action likewise demand that it be well-planned, using cooperative approaches.

Several recent reports and studies have emphasized the importance in collaborative efforts among libraries formulating preservation strategies. The Interim Report of the Council on Library Resources' Committee on Preservation and Access stated that "institutions will benefit economically when they collaborate with others; each will serve its own ends at a reduced cost."[3]

Another report on a survey conducted among members of the Research Libraries Group found that respondents were more willing to cooperate in preservation selection than in acquisitions selection. One conclusion of this report was that, for the purpose of preservation, access is more important than ownership.[4]

A mass deacidification facility, as it relates to storage needs for Ohio libraries, would result in the development of selection guidelines for use of the facility. Guidelines would be set and valuable experience gained in the moving and bibliographic control of large quantities of various types of materials owned by different institutions. It would encourage cooperation among participating libraries for treating specific portions of their collections without needless overlap or duplication in certain areas.

The Suitability of Ohio as a Location for a Cooperative Mass Deacidification Facility

Ohio would seem to be an ideal state for location of a mass deacidification facility and for leading the nation in developing a model for such cooperative treatment. This statement is based upon the following factors:

1. There is a high density of public, academic, institutional and special libraries in the State; some 589 such institutions with total holdings of over 58 million volumes.

2. The degree of statewide cooperation around preservation issues that has already been achieved is impressive and possibly unique.

3. The participating libraries are actively engaged in developing other tools, apart from mass deacidification, to cope with their collective preservation problems. For example, the OCC Task Force on Preservation Microfilming is working both to increase the level of

[2]Dan C. Hazen, "Collection Development, Collection Mangement and Preservation," *Library Resources and Technical Services* 27 (January, 1982): 6.

[3]Council on Library Resources, Committee on Preservation and Access, *Interim Report* (Washington, DC: Council on Library Resources, 1985): 4.

[4]"Selection for Preservation: An RLG Survey," *National Preservation News* (October, 1985): 4.

in-house filming and to create mechanisms for linking local programs into a coherent statewide effort.

4. Through the work of the OCC's Information Office (OCCIO) in Columbus, Ohio can point to a growing base of professional competence in the preservation field, widely distributed among public, academic and special libraries.

In short, there exists in Ohio a context of complementary preservation activities within which mass deacidification can assume its proper role. All of the above factors will contribute to effective utilization of a mass deacidification facility in Ohio.

Ohio Conservation Committee Recommendations

The OCC Sub-Committee on Mass Deacidification studied all available literature on known processes in order to arrive at a recommendation for a facility in Ohio. Members visited the one working facility available for inspection and reviewed all possibilities with experts before reaching a decision. The facility chosen had to meet the following criteria:

1. it had to meet safe working conditions at least as stringent as those set by OSHA;

2. it had to be of suitable size for the region with the possibility for future expansion;

3. it had to be capable of incorporation within an existing or soon-to-be built structure;

4. its capital and production costs had to be within reach;

5. there had to be a similar prototype in operation that could be evaluated.

Based on these criteria, the Sub-Committee on Mass Deacidification finds the Wei T'o system to be the only one suitable for Ohio's libraries. Sub-Committee members visited the Canadian Wei T'o facility and observed it in operation. They were impressed with the relative simplicity of the process, its high safety standards and its relatively low per book cost of deacidification.

A facility on the scale of the one at the public Archives of Canada is capable of deacidifying 5,000 books per week, or 260,000 volumes per year, if operated twenty-four hours a day, seven days a week. In Ohio a larger facility could be installed to increase output. The Committee recommends a 6,000-square-foot facility to accommodate a larger Wei T'o system. We have estimates that the construction of a facility of that size would cost from $600,000 to $800,000. The external manufacturing equipment, installation, development and updating expenses have cost the Public Archives of Canada $500,000 through 1984. The treatment cost at the Canadian facility is currently estimated at $3.47 (U.S.) per book.

While the Sub-Committee on Mass Deacidification can endorse Wei T'o, it does recommend the continuing study of mass deacidification processes as well as in-depth study of the deacidification and its potential for preventing the deterioration of printed materials in Ohio libraries.

The Sub-Committee believes that mass deacidification needs to be a serious concern of the Library Study Committee. The future of Ohio's library resources remain at risk.

Ohio Conservation Committee
Sub-Committee on Mass Deacidification

Members:
Susan B. Barnard, Kent State University
Wesley L. Boomgaarden, Ohio State University
Toby Heidtmann, University of Cincinnati
Dina Shoonmaker, Oberlin College
Vernon Will, Ohio Historical Society
Edward Seely, Cleveland Public Library, Chairman

Ex Officio Members:
Gary A. Hunt, Ohio University
Rebecca H. Winkle, Director, Ohio Cooperative Conservation Information Office

October, 1986

APPENDIX D

Technology Review

TECHNOLOGY REVIEW

Technology is often viewed as a solution to the problems of storing, retrieving, and accessing information. Since the invention of the printing press, libraries have benefitted from technology. However, it has only been in the last twenty-five years that technology has had a major impact on library operation. These past twenty-five years have seen the widespread acceptance of computer and communications technologies. Even greater changes have been predicted for the next few decades with the emergence of the "information age," the "electronic era," "global village" or the "paperless society."

The following is a brief description of the major technologies or technological issues that are affecting, or beginning to affect in a significant way, the operations of libraries.

Storage Technologies

Microformat. The use of microfilm, microfiche, and other similar microformats can dramatically reduce library space requirements. Microformat technology, which dates from the 1930's, is stable and well understood. All major academic libraries have substantial quantities of microfilm or microfiche materials in their collections, and this medium is familiar to most academic library users. Microformats are a proved archival medium.

Microformats can be used in three primary ways: (1) as an alternative to binding for current journals, (2) as a replacement for older volumes of bound journals, and (3) for the filming of materials currently in the stacks. A good economic argument can be made for using commercially available copies of microformats as a substitute for binding since the price of such copies is less than the cost of binding. However, using microformats in this way only slows the rate of total collection growth. No existing space is freed.

The other two applications of microformats must be weighed carefully because of cost. It is difficult to achieve significant savings by replacing bound volumes in compact storage with microformats, often costing $50.00 or more per volume. Therefore this approach usually can be justified only as a means of preserving deteriorating materials.

Optical Disk. Within the last few years there have been impressive gains in optical storage technologies. Three distinct types of optical storage exist; read only (CD ROM), write once (WORM), and erasable.

The CD ROM uses the same technology that was developed for the compact audio disc. Except for the content, the discs are identical to the audio version. The CD ROM can store 550 million bytes, enough to store the contents of several hundred books. While the mastering cost is high, usually over $10,000, the discs can be replicated for about $10. When the mastering cost can be spread over a large production run, the CD ROM offers an extremely economical means of storing and distributing information. CD ROM drives are available for microcomputers in the $500 to $1,000 price range, and price decreases are expected.

Because of the high mastering cost, the CD ROM is not a practical storage medium for information when only a few copies are required. For that type of information, the WORM (Write One, Read Mostly) non-erasable optical disks are better suited. These devices can be used with most sizes of computers, including microcomputers. While the per disk cost is more expensive than the CD ROMs, they are still an inexpensive storage medium. Capacities of WORM disks range up to 2 billion characters, sufficient to store approximately 2,000 books. The acceptance of the WORM disks may increase with IBM's announcement that they are a standard peripheral for their new System 2 microcomputers. Juke box drives are available for WORM disks, permitting up to 200 billion characters to be available on-line. A single such unit has a storage capacity equal to many small or medium size libraries. Although WORM disks are being used for long term data storage, they are not yet a proved archival medium.

Erasable Optical disks are the newest form of optical storage for computers. This format is not yet generally available although several companies have successfully demonstrated prototype systems. The initial versions of the erasable disks are not expected to offer significant advantages for long term information storage over the WORM disks since they are expected to be more expensive and have inferior archival characteristics.

Magnetic Storage. Magnetic storage is still the most

common means of storing machine-readable information. Magnetic tapes continue to be an inexpensive means of archiving information, and magnetic disks are a directly accessible medium with very high capacities. While magnetic storage is an old technology, major advances continue to be made in increasing storage density and capacity while reducing storage costs and access time. Magnetic disks have considerably faster access times than optical disks and, therefore, are more suitable for use with large mainframes. Most databases still use magnetic disks as their primary medium.

Retrieval Technologies

Technology has had its greatest impact in the area of information retrieval. Large centralized computer databases and the newest CD ROM-based products are gradually replacing the use of conventional card catalogs and print indexes. There is a wide variety of retrieval products and services currently available. A brief discussion of some of the more significant products and services follows.

Circulation Systems. All libraries which permit users to remove materials require some type of circulation system. For the past twenty years, the trend has been increasing to use computers to keep track of the materials which the library has loaned to patrons. Many of Ohio's academic libraries currently have computerized circulation systems, and the remaining manual systems are expected to be replaced in the near future.

OPACs. Online public access catalogs are gradually replacing the card catalogs in academic libraries. OPACs have proven to be more flexible, easier to use, and less costly to maintain than card catalogs. Unlike the card catalog, they also can be accessed from remote locations, thus making the collections available to a far larger group of potential users. A significant trend is to merge the circulation system and online catalog into a single integrated system.

Information Retrieval Systems. There are several online retrieval systems, including Bibliographic Retrieval System (BRS), Lockheed, Dialog, and Mead Data which provide centralized information databases. Use of online service is beginning to replace the use of the printed indexes. Although they cover a variety of different types of literature, their primary focus is journals. The services generally provide citations and often abstracts for the requested materials. The most significant trend is to extend the services to provide full text, thereby providing the user immediate access to a document.

Bibliographic Utilities. Bibliographic utilities started primarily as a means of providing libraries with cataloging records. There are four bibliographic utilities active in the United States: OCLC, Western Library Network (WLN), Research Library Group (RLG), and UTLAS. The Columbus-based OCLC, the largest of the four, serves over 7,000 libraries in North America and Europe. All state-assisted universities in Ohio have been OCLC members since the early seventies. In addition to providing cataloging records, OCLC also provides many other services to Ohio libraries. Holding information is recorded so that OCLC can provide information regarding the locations of over 270 million volumes represented in its database. As a result, OCLC can be used to identify the libraries in Ohio which hold a given title.

Access

For materials to be used, either the user must go to the facility where the materials are stored or the materials must be moved to the user. It is increasingly common to move the materials rather than the users. To speed the process, interlibrary loan requests are usually sent electronically.

Facsimile. This technology permits copies of material to be delivered electronically over telephone lines, making access almost instantaneous. Functionally, facsimile works much like conventional copiers except that the scanning and printing portions of the equipment are connected via a telecommunication line. While facsimile copying is not new, it has been affected by digital and microprocessor technology. For libraries, facsimile technology makes it possible to deliver quickly small quantities of information, such as articles, anywhere in the world. Older systems had compatibility problems, but as manufacturers accept the new standards, these problems are being reduced.

APPENDIX E

Comparable Information Regarding Library Facilities

COMPARABLE INFORMATION REGARDING LIBRARY FACILITIES

State/Facility:

California - University of California Northern Regional Library Facility

Type of Facility:

Compact, High-Density Library Storage Facility

Description of Facility:

The Northern Regional Library Facility is a cooperative high-density, low-use library storage facility. It was developed to store, preserve, and provide access to low use library materials for the libraries of the University of California and other northern California libraries. The 98,000 square feet building's first phase was completed in 1982. The current Facility has a capacity of 3.08 million volumes with expansion space for 13 million.

Capital Building Costs:

$8.5 million includes $1.9 million for shelving.

$305,000 for furnishings and equipment.

$1,089,000 for the HVAC system.

CAPITAL COST PER VOLUME:

$2.76 per volume.

OPERATING COSTS:

Estimated at $1.06 million per year (in 1986/87 dollars). The annual cost of storing each item is an estimated 7 cents per volume. The cost to provide access to an item (retrieve, circulate, reshelve) is an estimated $4.60 per item (does not include the cost of delivery and return transport).

Cost Comparison For Traditional Library Building in California:

No information available.

Information Source:

Ms. Gloria J. Stockton
Director
(415) 232-7767

State/Facility:

Illinois/Sixth Stack Addition

Type of Facility:

Compact Storage Facility

Description of Facility:

The Sixth Stack Addition at the University of Illinois is a compact storage facility with automatic movable shelving which houses 55 miles of shelving (approximately 2,030,000 volumes) on seven levels. There are seven volumes per linear foot stored, with a storage capacity of 238 volumes per sq. ft. of site area and 28.4 volumes per sq. ft. of floor area, as compared to 146 volumes and 12.1 volumes respectively for the existing stack facility.

Captital Building Costs:

$3.5 million for building the facility; $3.3 million for equipment; total capital costs = $6.8 million.

Capital Cost Per Volume:

$3.36 per volume.

Operating Costs:

Because this facility is an addition to the University of Illinois main library building, separate operating cost figures are not available. However, it should be noted that ½ FTE staff was hired to maintain the movable stacks. There were no additional personnel hired to provide library-related services in the Sixth Stack Addition, but existing personnel were reassigned to perform that function. It should be noted that all stacks are "closed" to persons other than faculty, graduate students, and staff at the University of Illinois—Urbana-Champaign campus.

Since this facility is attached to the central campus library, there are no special transportation costs as there might be in a remote storage facility.

Operating Costs Per Volume:

No information available.

Costs Comparison For Traditional Library Building in Illinois:

$3.36 per volume, compared to $4.89 per volume in a traditional library.

Information Source:

Mr. J. David Stewart
Assistant Vice President
for Planning and Budgeting
(217) 333-6600

State/Facility:

Massachusetts/Harvard Depository, Inc.

Type of Facility:

Remote Storage Library Facility

Description of Facility:

The Harvard Depository, Inc. is a warehouse-type storage facility which was opened in June, 1986, and will accommodate approximately 1.7 million volumes when filled to capacity. This is equivalent to 170,000 linear feet of books.

Capital Building Costs:

$1.8 million, excluding the cost of financing and land.

$2.2 million, including the cost of financing and land.

Captial Cost Per Volume:

$1.00 per volume, excluding the cost of financing and land.

$1.30 per volume, including the cost of financing and land.

Operating Costs:

1. Cost of Housing/Materials/Volumes:

   $.99 per linear foot (assumes full occupancy) = $168,300.

   Includes cost of three persons needed to run facility (will be reduced to two persons when facility is filled to capacity).

2. Transportation cost:

   Retrieval cost would be $.30 per linear book foot (includes cost of courier), assuming an annual circulation of 2½%.

Operating Cost Per Volume:

$.99 per volume (excluding transportation costs).

Cost Comparison For Traditional Library Building in That State:

$4.00 per volume (approximately).

Assumptions:

1. Cost projections for operation are based upon a total capacity of 1.7 million volumes.

2. Start-up costs are included in the $2.2 million.

Other:

1. A rental fee is charged to libraries for rental of space at a rate of $2.40 per linear book foot.

Information Source:

Dr. Richard Fryberger
Senior Project Planner
(617) 495-1000

APPENDIX F

A Proposal for Retrospective Conversion of Bibliographic Records

A PROPOSAL FOR RETROSPECTIVE CONVERSION OF BIBLIOGRAPHIC RECORDS

Summary

In 1979-80, the libraries of Ohio's twelve state-assisted universities, members of the Inter-University Library Council (IULC), developed a proposal for "retrospective conversion of bibliographic records" (conversion of cataloging information from card form to computer-readable form) as a high priority for action to encourage more sharing of library resources throughout Ohio. This project was intended to computerize, on OCLC*, information about the many books and serial publications (periodicals, yearbooks, etc.) held in the IULCV libraries but cataloged before the availability of OCLC, in 1971. The proposal was endorsed by the presidents of the universities at their meeting of September 1980, and a recommendation for line-item funding was included in the Ohio Board of Regents' budget request for 1981/83. Understandably, this request was omitted from the Governor's budget for that difficult biennium.

Since then, almost all of the IULC libraries have made progress in retrospective conversion, with institutional and some private and federal support. But cataloging for ca. 2.1 million items in these libraries remains to be converted, for which effort funding cannot readily be expected without the targeted support (estimated at ca. $4 million) sought in the proposal which follows.

Increases in OCLC charges, labor costs, and changes in cataloging standards have worked to make the retrospective conversion process more complex than was projected in 1979/80, and therefore more costly, now estimated to be an average cost of $1.93 per item. This proposal, it must be emphasized, would involve conversion of cataloging for only the major core of library holdings acquired before 1971, namely, conventional books and journals. It is felt widely among the IULC libraries that after completion of the project, which would require 2-3 years work, there should be a follow-on effort to add information to OCLC about tens of thousands of other items of great value in these collections, including government documents, maps, sound recordings, and items in microform.

*"OCLC" originally stood for Ohio College Library Center, a computer-based cooperative begun in 1967. It has since become the Online Computer Library Center, an international organization with a database of more than 13 million entries for books and other library holdings at more than six thousand libraries. Once any library has contributed cataloging for an item to the OCLC database, that information is available to all other affiliated libraries to catalog other copies, at which time a "holding symbol" is added to the database to show which libraries have that item. Savings in the cost of wasteful duplicative local cataloging are significant.

Introduction

The objective of resource sharing among libraries is to improve **access** to books, journals, and other library materials for library users — wherever the people or the library materials may be located. For that reason, all citizens of Ohio are potential beneficiaries of the project proposed herein. Anyone who fails to find a needed book or serial publication on the shelves of a local library may search the OCLC online union catalog to learn where in Ohio — or elsewhere in the country — that title may be available. The person may then request interlibrary loan of the item (or, perhaps, a photocopy of a needed section) or plan to travel to a library to use the item there. In either case, the objective of bringing together people and the books and serial publications they need — promptly and at least cost — is advanced. Availability of a substantial amount of information on the OCLC system already assists many thousands of Ohio citizens in locating needed books and journals from libraries throughout the state and nation.

Prerequisite to sharing of actual materials is the sharing of **cataloging** information — which describes the materials — and **holdings** information — which indicates in what libraries the items are located. Indeed, economies of shared cataloging (avoiding wasteful duplicate effort by highly trained staff) and consequent benefits of improved access to library collections were the principal reasons for the creation of the Ohio College Library Center's pioneering computer-based union catalog early in the 1970's. These needs have also been the impetus for OCLC's rapid and successful transformation into the international network (now known as the Online Computer Library Center) which links, online, more than six thousand libraries throughout North America and Europe.

The active cooperation of many Ohio libraries, including

all IULC members, in the creation and nurturing of OCLC (with significant support in early years from the Ohio Board of Regents) already has made possible substantial improvements in the ability of the IULC libraries to share books and journals among themselves and with other libraries (See Table A, appended). This extraordinary growth in direct sharing of library materials has been aided since 1981 by OCLC's implementation of the capability to transmit electronically, terminal-to-terminal, interlibrary loan messages among participating libraries. This supplements much slower and less reliable methods that depend on preparation of typewritten requests to be sent through the mails. OCLC has thus come far toward achieving one of its original goals: creation of a shared (or "union") catalog of library holdings which people may use to locate and then to request the loan of books and other items that their local libraries cannot provide.

But much remains to be done. The consensus of the IULC member libraries is that first attention must be given to completing the retrospective conversion of catalog records for books and serial publications (publications, journals, yearbooks, etc.) that were acquired and processed by the IULC libraries in the decades **before** the advent of OCLC. Without this project, much of the wealth of significant works of law, history, literature, art, music, and science acquired by several of these important libraries before 1971 simply cannot be identified and located by people who need them; nor, ultimately can decisions so readily be made about which titles (and copies of those titles) should be stored and preserved. An additional important consideration: it is judged essential that this project be undertaken to provide the computerized cataloging information about each IULC library's holdings which is essential if each library is to make more and better use of in-house computer-based circulation and catalog systems. (OCLC would make this information available to each library at minimal additional cost — as a direct by-product of the project.)

There has been significant demonstrated progress in recent years toward achieving the goal of improved library resource sharing in Ohio. For example, beyond the direct use of OCLC by more than 200 Ohio libraries for cataloging of currently received material, the cataloging and holdings information that represents the most important collections of the state's several major public libraries already has been added to OCLC in a similar cooperative project made possible by awards of federal funds through the State Library of Ohio under the Library Services and Construction Act (for which the project proposed herein is not eligible). Also, OHIONET (an organization of public, school, college, university, and special libraries, which is the state-level network successor to the Ohio College Library Center) and others from the commercial sector have assisted interested Ohio libraries in developing many in-house computer-based circulation, inventory-control, and catalog systems. These in-house systems could (indeed, ultimately should) also be connected library-to-library to make possible rapid identification about which books, journals, etc., across Ohio are available for use, information which is more specific than OCLC is intended to provide. For example, Ohio State already makes available to IULC libraries online access to its computerized catalog and circulation system (which incorporates holdings of the State Library of Ohio), thereby greatly facilitating awareness throughout Ohio of the day-to-day availability of many of the titles in these two centrally important collections.

Benefiting most, of course, from this project would be the thousands of faculty and tens of thousands of students at the IULC universities who would be able to have fuller awareness of what library collections exist in sister institutions across the state. But, as already indicated, all people in Ohio — many of whom may need to have access to titles not readily available in library collections close at hand — will also benefit. If this project is approved and funded, the state-assisted universities, by sharing their library collections more widely, will provide a better return for the taxpayer on the extraordinary capital investment that these collections represent.

It is precisely this advanced state of cooperation toward which all efforts at sharing of library resources in Ohio must ultimately be directed:

1. the presence of information on the OCLC system that identifies which books and other items are in which libraries,
2. development of links with local library information about each item's current availability for use or borrowing, and
3. development of improved systems to speed actual delivery of wanted items to the user.

Prerequisite to achieving these goals for the people of Ohio is completion of the computer-readable bibliographic data base of **all** significant cataloged book and journal holdings of the IULC libraries.

Proposal

A preliminary survey indicates that approximately 2.1 million catalog entries for books and serial publications held by IULC member libraries are candidates for conversion to computerized form (See Table B, appended). Based on experience in retrospective conversion efforts elsewhere in the nation, it is estimated that direct costs of the project will average $1.93 per catalog record converted — for a total of ca. $4 million, to be distributed among the libraries based on the extent and estimated difficulty of each library's task.

The costs of retrospective conversion will vary from library to library because of the types of cataloging involved, whether relatively straightforward or complicated. In the case of especially complex problem-solving, for which work must be done by a professional librarian-cataloger, costs obviously increase. To illustrate: The **lowest** direct cost (labor and OCLC charges) of converting a traditional catalog card record to computer-readable form is approximately 55¢, in those instances in which a special microcomputer-based program offered by OCLC could be employed. This most simple type of conversion would meet, for example, many of the needs of both Ohio State and Miami for much of their portion of the project, but beyond that, there exists a continuum of increasingly complex work, moving from that which must be performed by Classified Civil Service and paraprofessional staff to work which librarians must perform. The $1.93 average unit cost of conversion estimated for this project reflects a mix of relatively older and therefore often problematic cataloging, and takes into particular account the highly complex cataloging of serial publications represented. As a check on this estimate, comparison was made with a similar project recently funded at the University of Minnesota, where conversion costs are projected to average $2.30 per item for ca. 1.1 million items.

Each IULC member library will be responsible for its own portion of the project, making local decisions about the most efficient mix of methods to be used, that is, whether to do the work on site or to contract with others (including OCLC) to do the work. Administrative costs and other overhead expenses will be borne by each library; and all have agreed that the project, as described, will be completed without requesting additional special funding from state government.

Conclusion

This proposed investment in cooperation will make possible a substantial advance in the effectiveness of the libraries of state-assisted universities in Ohio. The results will benefit the many individuals and groups who rely on these libraries to support research and teaching and will advance other educational and cultural interests in the state. Expenditures of a relatively modest amount (when viewed in the context of the value of the books and journals in the collections) would go far toward making more useful to all citizens of Ohio the full range of extensive library holdings collected during the last century.

The principal benefits that would accrue to the people of Ohio are as follows:

1. The presence of more cataloging and holdings information on OCLC will promote direct improvements in interlibrary cooperation, as virtually all Ohio libraries will be better able to identify for their users items available to be borrowed from (or consulted on site at) the IULC libraries. The comparison of statistical information on borrowing of books by the IULC libraries from 1967/68 — before the advent of OCLC — with that for 1984/85 (represented in Table A) is direct and striking evidence of one of the most positive consequences of the creation of the OCLC online union catalog, but can only suggest the greatly increased benefits that the addition of more data to OCLC would promote.

2. The speed of transmitting many borrowing requests from one library to another will be substantially increased, since requests can more readily be transmitted online on the OCLC interlibrary loan subsystem.

3. The patterns of borrowing among Ohio libraries may be changed so as to distribute interlibrary lending and borrowing more widely among these libraries. Traditionally, if a person at a given library requests an item not available locally, that library's staff, being unaware of more geographically convenient copies of the wanted title, usually seeks to borrow it from larger, often remote libraries. This clearly places an unnecessarily uneven burden on library resources throughout the state. With comprehensive statewide information about more libraries' holdings, many

Ohio citizens should find more desired titles at closer and more conveniently located libraries.

4. More informed decisions about local retention or off-site storage and preservation of older books and journals will be possible among Ohio's libraries only if cataloging and holdings information for all items is widely and readily available online. This benefit will, in the long term, prove to be of the greatest importance in comprehensive cooperative storage and preservation programs. It must be emphasized here that retrospective conversion would have minimal effects on the need for funding for **current** acquisitions, since faculty and students will continue to expect to find most recently published basic items on the shelves of their local campus library.

TABLE A
INTERLIBRARY BORROWING BY IULC MEMBER LIBRARIES: A COMPARISON

Institution	1967/68 (PRE-OCLC)*		1984/85**		
	TOTAL No. Items Borrowed	... from Ohio libraries	TOTAL No. Items Borrowed	... from Ohio libraries	... from Ohio libraries via OCLC
Akron	1,425	930	7,123	N/A	4,830
Bowling Green	933	286	4,391	3,014	2,894
Central State	158	146	—	—	—
Cincinnati	740	165	6,521	3,651	2,547
Cleveland State	1,091	936	11,122	6,845	6,442
Kent State	3,470	1,108	8,364	5,688	5,298
Miami	837	723	3,626	2,173	2,012
Ohio State	5,739	858	8,289	4,318	1,130
Ohio University	2,742	999	9,940	6,314	5,715
Toledo	862	216	4,607	3,145	3,140
Wright State	936	610	2,223	1,690	1,407
Youngstown	75	40	2,082	1,501	1,256
TOTAL	19,007	7,017	68,288	38,339	36,671

As reported in Goldwyn, A. J. and Edward Verhosek, **A Study of Extra-Institutional Use of Libraries by Ohio Academic Personnel. (Cleveland: Case Western Reserve University School of Library Science, 1969), p. 38.*

***As reported in a survey conducted by W. J. Crowe, Ohio State University Libraries, Winter 1985/86.*

POSSIBLE DISTRIBUTION OF RETROSPECTIVE CONVERSION FUNDS

Akron	ca. 8,500 items @	$2.25 / item	$ 19,125
Bowling Green State	32,300	2.25	72,675
Cincinnati	193,000	2.10	405,300
Cleveland State	18,500	2.25	41,625
Kent State University	15,000	2.25	33,750
Miami	458,000	2.00	916,000
Ohio State University	1,100,000	1.80	1,980,000
Ohio University	175,000	2.10	367,500
Shawnee State	550	2.25	1,238
Toledo	10,000	2.25	22,500
Wright State University	10,500	2.25	23,625
Youngstown State University	35,100	2.25	78,975
	2,055,450	$1.93	$3,962,313

TABLE B
CATALOG RECORDS FOR BOOKS AND SERIALS AT IULC MEMBER LIBRARIES
AVAILABLE FOR CONVERSION TO MACHINE-READABLE FORM

	BOOKS	SERIALS (PERIODICALS)
Akron	8,500	(none)
Bowling Green State	32,000	300
Central State	(none)	(none)
Cincinnati	175,000	18,000
Cleveland State*	13,500	5,000
Kent State	15,000	(none)
Miami	450,000	8,000
Ohio State*	1,020,000	80,000
Ohio University	174,500	500
Shawnee State	(none)	550
Toledo*	6,000	4,000
Wright State	4,500	6,000
Youngstown State	35,100	(none)
TOTALS	1,934,100	122,350

**Includes the Law Library (Conversion projects have been completed at other law libraries.)*

BIBLIOGRAPHY

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Reports from Various States

ALABAMA

"Cooperative Library Resource Sharing Among Universities Supporting Graduate Studies in Alabama." Alabama Commission on Higher Education, Montgomery (April, 1982). Photocopy report by Alabama Commission on Higher Education Council of Librarians.

Medina, Sue O. "Network of Alabama Academic Libraries: An Emerging State Network." Alabama Commission on Higher Education, Montgomery (1986). Draft photocopy.

ARIZONA

"Arizona State University West Campus Mission and Scope Statement." *Administrator* (January 12, 1987). Includes description of ASU West Library collection. Photocopy.

"Arizona State University Libraries Collection Development Policy Statement: A Planning Tool for the Future Growth of the Collections." *Administrator* (January 12, 1987). Photocopy.

"Staffing Implications of ASU West Library Model." *Administrator* (January 12, 1987). Photocopy.

CALIFORNIA

Lawrence, Gary S. "A Cost Model for Storage and Weeding Programs." *College and Research Libraries* (March, 1981): 139-147.

Lawrence, Gary S. and Anne R. Oja. "An Economic Criterion for Housing and Disposing of Library Materials, Based on Frequency of Circulation." Library Studies and Research Division, University of California Systemwide Administration, Research Report RR-79-2 (September 24, 1979).

Lawrence, Gary S. and Anne R. Oja. "The use of General Collections at the University of California: A Study of Unrecorded Use, At-the-Shelf Discovery, and Immediacy of Need for Materials at the Davis and Santa Cruz Campus Libraries." Library Studies and Research Division, University of California Systemwide Administration, Research Report RR-80-1 (January 30, 1980).

Scheiber, Harry N. "UC Libraries: A Plan for Development." University of California-San Diego (November, 1976). Review of the document.

"The University of California Libraries: A Plan for Development, 1978-88." Office of the Executive Director of Universitywide Planning (July, 1977). Photocopy.

Thompson, Donald D. "In-house Use of Immediacy of Need: The Riverside Pilot Studies." Library Studies and Research Division, University of California Systemwide Administration (November, 1978). Pilot study.

COLORADO

Johns, Claude and Beverly Moore, editors. "Colorado Academic Library Master Plan." Colorado Commission on Higher Education (March, 1985). Revision of 1982 document. Photocopy.

CONNECTICUT

"New Directions for Educational Technology." Connecticut State Department of Education, Hartford (1983). Committee report and recommendations by Joint Committee on Educational Technology. Photocopy.

ILLINOIS

Collier, Martin H. "Sixth Stack Addition: The University of Illinois Tops Off Its Storage Capacity with a High Density Mobile Shelving Storage Facility." *Library Journal* (December 1, 1982).

"Expansion and Enhancement of the Library Computer System (LCS) in Illinois: A Proposal for Support through the Higher Education Cooperation Act." Report of Illinois Library Computer Systems Organization (October, 1986). Photocopy.

McBride, Ruth B. "Experiences with Compact Shelving at a Major University Library." *Library Administration and Management Association* (1985).

Peterson, Kenneth G. "Promoting Cooperation Among Academic Libraries in Illinois: The Role of the IACRL/IBHE Liaison Committee." *Illinois Libraries*, Office of the Secretary of State, Illinois State Library, Vol. 68:7 (September, 1986): 465-470.

"Report of the Space Utilization Subcommittee Regarding Library Stack Shelving Capacities and Needs in Illinois Public Universities." Report

developed by a subcommittee appointed by IACRL/IBHE (July, 1984).

Sloan, Bernard G. "Resource Sharing Among Academic Libraries: the LCS Experience." *The Journal of Academic Librarianship*, Volume 12 (1986): 26-29.

MARYLAND

"The Status of Academic Libraries in Maryland's Public Colleges and Universities." State Board for Higher Education, Annapolis, (March, 1985).

MINNESOTA

Longanecker, David A. "MINITEX/OPLIC Task Force Report on Standards for Online Catalogs and Online Circulation Systems." (1984 revision). Photocopy.

"Library Automation in the MINITEX Region: A Status Report to the Bush Foundation." Minnesota Higher Education Coordinating Board (June 9, 1986). Photocopy.

"Minnesota Interlibrary Telecommunications Exchange (MINITEX): A Status Report." Minnesota Higher Education Coordinating Board (March, 1986). Photocopy.

NEBRASKA

"Nebraska's Plan for the Coordination of Postsecondary Educational Libraries: A Preliminary Statement." The Postsecondary Library Directors of Nebraska (May 14, 1976). Photocopy.

OHIO

"Directory of Ohio Libraries, 1987." State Library of Ohio, Columbus. Addresses and personnel listings for the State Library and all academic, institutional, public, special, and school library media centers in Ohio.

OKLAHOMA

"Academic Libraries: Annual Report on Academic Libraries in Oklahoma." Oklahoma State Regents for Higher Education (April 1986). Photocopy.

"Academic Libraries: A Comprehensive Study of Academic Libraries in Oklahoma." Oklahoma State Regents for Higher Education (May, 1985). Photocopy.

PENNSYLVANIA

"Access Pennsylvania: An Agenda for Knowledge and Information Through Libraries." Department of Education, Harrisburg (September 4, 1984). Library Planning Council, State Library of Pennsylvania. Photocopy.

SOUTH DAKOTA

Eaton, Nancy, John Mayeski, and Robert D. Stuart. "Toward the Twenty-First Century: Publicly Supported Academic Libraries and the State Library of South Dakota." South Dakota Board of Regents, Pierre (1986). Photocopy.

TENNESSEE

"Report on the Estimated Cost of Full Participation in OCLC Solinet by Public Postsecondary Academic Libraries." Tennessee Higher Education Commission (September, 1986). Photocopy.

VIRGINIA

"Academic Library Facility Needs in Virginia's Public System of Higher Education." Virginia State Council of Higher Education (December, 1986). Photocopy.

"Academic Library Facility Needs in Virginia's Public System of Higher Education." Task Force on Library Facilities (October, 1986). Photocopy.

Miscellaneous Documents

"An Evaluative Checklist for Reviewing a College Library Program." *C&RL News* (no date included): 305-316. Standards and accreditation Committee of the ACRL Adopted by the ACRL Board of Directors, June, 1979.

"ARL Statistics, 1985-86." Association of Research Libraries (August 22, 1986).

Bok, Derek. "President's Report, 1983-84." Harvard University (March, 1985).

Coughlin, Ellen K. "University Librarians Fear the Impact of Budget Cuts at Library of Congress." *The Chronicle of Higher Education* (May 21, 1986).

Gardner, David Pierpont. "The Charge of the Byte Brigade: Educators Lead the Fourth Revolution." *Educational Record* (Winter, 1986): 10-15.

"Guidelines for Two-Year College Learning Resources Programs (Revised)." *C&RL News* (January/

February, 1982). Approved by the ACRL Board of Directors, June, 1981.

Hyatt, James A. "University Libraries in Transition." *NACUBO Business Officer* (June, 1986): 35-39.

"Kellogg Gives $3.7 Million for Electronic Archive." *The Chronicle of Higher Education* (October 15, 1986).

Rochell, Carlton C. "The Next Decade: Distributed Access to Information" *Library Journal* (February 1, 1987): 42-48

"Standards for College Libraries, 1986." *C&RL News* (March, 1986): 189-200. Prepared by the College Library Standards Committee and approved by the ACRL Board of Directors, January, 1986.

"Standards for University Libraries." *College and Research Library News* (April, 1979): 103-110. Statement prepared by a joint committee of the ARL and ACRL of the American Library Association.

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